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THE

AMERICAN EPHEMERIS

AND

NAUTICAL ALMANAC

FOR THE YEAR

1909

FIRST EDITION

PUBLISHED BY AUTHORITY OF CONGRESS

WASHINGTON
BUREAU OF EQUIPMENT
1906

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PREFACE.

The general arrangement of the *American Ephemeris and Nautical Almanac*, with few slight changes, remains the same with the volume for the year 1900.

The Ephemeris is divided into four parts, as follows:

Part I, *Ephemeris for the Meridian of Greenwich*, which gives the ephemerides of the Sun and Moon, the geocentric and heliocentric positions of the major planets, the Sun's co-ordinates, and other fundamental astronomical data for equidistant intervals of Greenwich mean time.

Part II, *Ephemeris for the Meridian of Washington*, which gives the ephemerides for the fixed stars, Sun, Moon, and major planets for transit over the meridian of the new Naval Observatory, Washington. The mean places of the fixed stars and the data for their reduction are also included in this part.

Part III, *Phenomena*, which contains predictions of phenomena to be observed, with data for their computation. Washington mean time for the meridian of the new Naval Observatory is used throughout this part except in a few cases, notably those of eclipses, where Greenwich mean time seems more convenient.

Part IV, *Star numbers, apparent places of stars, and other data based on the Constants of the Paris Conference of 1896*, which gives precession, obliquity, etc., Besselian star-numbers, independent star-numbers, ephemerides of five northern circumpolar stars, and ephemerides of twenty-five other stars whose apparent places differ from those given in Part II.

WALTER S. HARSHMAN,
Professor of Mathematics, U. S. Navy,
Director Nautical Almanac.

WASHINGTON, *May, 1906.*

CONTENTS.

Page
Corrections . . . vi
Chronological Eras and Cycles . . . vii
Symbols and Abbreviations . . . viii

PART I—*EPHEMERIS FOR THE MERIDIAN OF GREENWICH.* Pages of Each Month

Ephemeris of the Sun . . . I–III
Ephemeris of the Moon . . . IV–XII
Phases of the Moon . . . XII
Lunar Distances . . . XIII–XVIII
Page
Geocentric Ephemerides of the Planets Mercury, Venus, Mars, Jupiter, Saturn, Uranus, Neptune . 218
Heliocentric Ephemerides of the Planets Mercury, Venus, Mars, Jupiter, Saturn, Uranus, Neptune . 250
Sun's Co-ordinates . . . 272
Moon's Longitude and Latitude . . . 280
Moon's Equator, Mean Longitude, etc. . . . 284
Moon's Libration; Sun's Aberration and Horizontal Parallax . . . 285
Precession, Nutation, Obliquity, etc. . . . 286
Nutation, Terms of Short Period in the . . . 287

PART II—*EPHEMERIS FOR THE MERIDIAN OF WASHINGTON.*

BESSEL'S Formulæ for Star-Reductions, Constants of *Struve* and *Peters* . . . 290
Besselian and Independent Star-Numbers, " " " . . . 291
Besselian and Independent Star-Numbers, exclusive of short period terms, for every tenth sidereal day 303
Mean Places of Standard Stars for 1909.0 . . . 304
Apparent Places of Five Circumpolar Stars . . . 312
Apparent Places of Remaining Standard Stars . . . 324
Solar Ephemeris . . . 400
Moon-Culminations . . . 408
Transit-Ephemerides of the Planets Mercury, Venus, Mars, Jupiter, Saturn, Uranus, Neptune . 416

PART III—*PHENOMENA.*

Eclipses . . . 436
Moon's Phases, Apogee, Perigee, and Greatest Libration . . . 440
Mean Places of Stars Occulted by the Moon . . . 441
Elements for the Prediction of Occultations . . . 445
Occultations Visible at Washington . . . 480
Disks of Mercury, Venus, and Mars . . . 483
Satellites of Mars, Jupiter, Saturn, Uranus, and Neptune . . . 486
Phenomena, Planetary Configurations . . . 519
Positions of Observatories . . . 521

PART IV—*APPARENT PLACES OF STARS, STAR-NUMBERS, ETC., BASED ON THE CONSTANTS OF THE PARIS CONFERENCE.*

BESSEL'S Formulæ for Star-Reductions . . . 528
Precession, Nutation, Obliquity, etc. . . . 529
Besselian and Independent Star-Numbers . . . 530
Apparent Places of Five Circumpolar Stars . . . 542
Apparent Places of Twenty-five Standard Stars . . . 554
On the Arrangement and Use of *The American Ephemeris and Nautical Almanac* . . . 561

APPENDIX.

On the Construction of *The American Ephemeris and Nautical Almanac* for 1909 . . . 587

TABLES.

Table I.—Correction of Lunar Distances for Second Differences in Moon's Motion . . . 592
Table II.—Reduction of Sidereal to Mean Solar Time . . . 593
Table III.—Reduction of Mean Solar to Sidereal Time . . . 596
Table IV.—Latitude by Observation of the Altitude of Polaris . . . 599

CORRECTIONS.

Ephemeris, 1907, first edition only.

Page.			
223,	Semid. Dec. 31	*for* 2.33	*read* 2.36
405,	Sid. time, Sept 20	*for* $11^h\ 43^m$	*read* $11^h\ 53^m$
527,	Precession for 1907	*for* 50.2575	*read* 50.2580

Ephemeris, 1908, first edition only.

248,	Dec. 34, Var. R. A.	*for* 15.336	*read* 15.342
527,	at foot of the page	*for* 1.70120	*read* 1.70121
		0.1377	0.1376
		0.1373	0.1372
		9.13893	9.13863
		9.13773	9.13744

CHRONOLOGICAL ERAS AND CYCLES.

CHRONOLOGICAL ERAS.

THE YEAR 1909, WHICH COMPRISES THE LATTER PART OF THE 133D AND THE BEGINNING OF THE 134TH YEAR OF THE INDEPENDENCE OF THE UNITED STATES OF AMERICA, CORRESPONDS TO—

The year 6622 of the Julian Period;

" 7417–7418 of the Byzantine era, the year 7418 commencing on September 1;

" 5669–5670 of the Jewish era, the year 5670 commencing on September 16, or, more exactly, at sunset on September 15;

" 2662 since the foundation of Rome, according to VARRO:

" 2656 since the beginning of the era of NABONASSAR, which has been assigned to Wednesday, the 26th of February of the 3967th year of the Julian Period; corresponding, in the notation of chronologists, to the 747th, and, in the notation of astronomers, to the 746th year before the birth of CHRIST;

" 2685 of the Olympiads, or the first year of the 672d Olympiad, commencing in July, 1909, if we fix the era of the Olympiads at 775½ years before CHRIST, or near the beginning of July of the year 3938 of the Julian Period;

" 2221 of the Grecian era, or the era of the SELEUCIDÆ, which began near the vernal equinox of the year, — 311 = B. C. 312, = 4402 of the Julian Period;

" 1625 of the era of DIOCLETIAN;

" 2569 of the Japanese era and to the 42d year of the period entitled "Meiji."

The year 1327 of the Mohammedan era, or the era of the Hegira, begins on the 23d day of January, 1909.

The first day of January of the year 1909 is the 2,418,308th day since the commencement of the Julian Period.

CHRONOLOGICAL CYCLES.

Dominical Letter	C	Solar Cycle	14
Epact	8	Roman Indiction	7
Lunar Cycle or Golden Number	10	Julian Period	6622

SYMBOLS AND ABBREVIATIONS.

SIGNS OF THE PLANETS, ETC.

☉	The Sun.	♂	Mars.
☾	The Moon.	♃	Jupiter.
☿	Mercury.	♄	Saturn.
♀	Venus.	♅	Uranus.
⊕	The Earth.	♆	Neptune.

SIGNS OF THE ZODIAC.

Spring Signs.	1.	♈	Aries.	Autumn Signs.	7.	♎	Libra.
	2.	♉	Taurus.		8.	♏	Scorpius.
	3.	♊	Gemini.		9.	♐	Sagittarius.
Summer Signs.	4.	♋	Cancer.	Winter Signs.	10.	♑	Capricornus.
	5.	♌	Leo.		11.	♒	Aquarius.
	6.	♍	Virgo.		12.	♓	Pisces.

ASPECTS.

☌ Conjunction, or having the same Longitude or Right Ascension.
□ Quadrature, or differing ±90° in Longitude or Right Ascension.
☍ Opposition, or differing 180° in Longitude or Right Ascension.

ABBREVIATIONS.

☊	Ascending Node.	°	Degrees.
☋	Descending Node.	′	Minutes of Arc.
N.	North.	″	Seconds of Arc.
S.	South.	^{h}	Hours.
E.	East.	^{m}	Minutes of Time.
W.	West.	^{s}	Seconds of Time.

PART I

ASTRONOMICAL EPHEMERIS

FOR THE

MERIDIAN OF GREENWICH.

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S Apparent Right Ascension.	THE SUN'S Diff. for 1 Hour.	THE SUN'S Apparent Declination.	THE SUN'S Diff. for 1 Hour.	THE SUN'S Semi-diameter.	Sidereal Time of Semi-diameter Passing Meridian.	Equation of Time, to be Added to Apparent Time.	Diff. for 1 Hour.
		h m s	s	° ′ ″	″	′ ″	s	m s	s
Frid.	1	18 45 33.22	11.045	S. 23 2 17.7	+ 12.01	16 17.89	71.06	3 33.80	1.184
Sat.	2	18 49 58.14	11.029	22 57 15.5	13.17	16 17.90	71.00	4 2.08	1.169
SUN.	3	18 54 22.67	11.014	22 51 45.7	14.31	16 17.90	70.96	4 29.97	1.154
Mon.	4	18 58 46.82	10.998	22 45 48.7	+ 15.44	16 17.89	70.91	4 57.49	1.138
Tues.	5	19 3 10.57	10.980	22 39 24.6	16.56	16 17.88	70.86	5 24.60	1.120
Wed.	6	19 7 33.87	10.961	22 32 33.6	17.68	16 17.86	70.80	5 51.28	1.101
Thur.	7	19 11 56.70	10.941	22 25 16.0	+ 18.79	16 17.84	70.74	6 17.48	1.081
Frid.	8	19 16 19.05	10.920	22 17 31.9	19.89	16 17.81	70.67	6 43.20	1.061
Sat.	9	19 20 40.90	10.899	22 9 21.4	20.98	16 17.78	70.60	7 8.42	1.040
SUN.	10	19 25 2.22	10.877	22 0 44.8	+ 22.06	16 17.74	70.53	7 33.12	1.018
Mon.	11	19 29 22.98	10.853	21 51 42.5	23.12	16 17.69	70.45	7 57.25	0.994
Tues.	12	19 33 43.16	10.829	21 42 14.8	24.18	16 17.64	70.37	8 20.81	0.969
Wed.	13	19 38 2.75	10.803	21 32 21.8	+ 25.23	16 17.58	70.28	8 43.78	0.944
Thur.	14	19 42 21.72	10.777	21 22 3.8	26.27	16 17.51	70.19	9 6.14	0.919
Frid.	15	19 46 40.07	10.751	21 11 21.1	27.29	16 17.44	70.10	9 27.87	0.892
Sat.	16	19 50 57.77	10.723	21 0 14.0	+ 28.30	16 17.36	70.01	9 48.95	0.864
SUN.	17	19 55 14.79	10.695	20 48 42.7	29.30	16 17.28	69.91	10 9.36	0.836
Mon.	18	19 59 31.13	10.666	20 36 47.6	30.28	16 17.20	69.81	10 29.09	0.807
Tues.	19	20 3 46.76	10.636	20 24 29.1	+ 31.25	16 17.11	69.71	10 48.11	0.777
Wed.	20	20 8 1.67	10.606	20 11 47.4	32.21	16 17.02	69.61	11 6.41	0.747
Thur.	21	20 12 15.83	10.574	19 58 43.0	33.15	16 16.93	69.50	11 23.96	0.715
Frid.	22	20 16 29.22	10.542	19 45 16.3	+ 34.07	16 16.83	69.40	11 40.75	0.683
Sat.	23	20 20 41.83	10.509	19 31 27.5	34.98	16 16.73	69.29	11 56.76	0.651
SUN.	24	20 24 53.66	10.476	19 17 17.0	35.88	16 16.62	69.18	12 11.99	0.618
Mon.	25	20 29 4.68	10.442	19 2 45.1	+ 36.76	16 16.52	69.07	12 26.41	0.584
Tues.	26	20 33 14.88	10.407	18 47 52.4	37.62	16 16.41	68.96	12 40.02	0.550
Wed.	27	20 37 24.25	10.372	18 32 39.2	38.47	16 16.29	68.85	12 52.80	0.515
Thur.	28	20 41 32.79	10.337	18 17 5.9	+ 39.30	16 16.17	68.74	13 4.75	0.481
Frid.	29	20 45 40.49	10.303	18 1 12.9	40.11	16 16.05	68.63	13 15.86	0.446
Sat.	30	20 49 47.34	10.268	17 45 0.6	40.90	16 15.92	68.51	13 26.13	0.411
SUN.	31	20 53 53.36	10.233	17 28 29.5	41.68	16 15.79	68.39	13 35.57	0.376
Mon.	32	20 57 58.54	10.198	S. 17 11 39.9	+ 42.45	16 15.65	68 28	13 44.16	0.341

NOTE.—The mean time of semidiameter passing the meridian may be found by subtracting $0^s.19$ from the sidereal time. The sign + prefixed to the hourly change of declination indicates that south declinations are decreasing.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S				Equation of Time, to be Subtracted from Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.			
		h m s	s	° ′ ″	″	m s	s	h m s
Frid.	1	18 45 32.57	11.042	S. 23 2 18.4	+ 12.01	3 33.73	1.184	18 41 58.84
Sat.	2	18 49 57.40	11.026	22 57 16.4	13.17	4 2.00	1.169	18 45 55.40
SUN.	3	18 54 21.84	11.011	22 51 46.8	14.31	4 29.88	1.154	18 49 51.96
Mon.	4	18 58 45.91	10.994	22 45 50.0	+ 15.44	4 57.39	1.138	18 53 48.52
Tues.	5	19 3 9.58	10.977	22 39 26.1	16.56	5 24.50	1.120	18 57 45.08
Wed.	6	19 7 32.80	10.959	22 32 35.4	17.67	5 51.17	1.101	19 1 41.63
Thur.	7	19 11 55.56	10.939	22 25 18.0	+ 18.77	6 17.37	1.081	19 5 38.19
Frid.	8	19 16 17.83	10.918	22 17 34.1	19.88	6 43.08	1.061	19 9 34.75
Sat.	9	19 20 39.60	10.896	22 9 23.9	20.98	7 8.29	1.040	19 13 31.31
SUN.	10	19 25 0.85	10.874	22 0 47.6	+ 22.05	7 32.98	1.018	19 17 27.86
Mon.	11	19 29 21.54	10.850	21 51 45.6	23.12	7 57.12	0.994	19 21 24.42
Tues.	12	19 33 41.66	10.826	21 42 18.2	24.18	8 20.68	0.969	19 25 20.98
Wed.	13	19 38 1.18	10.801	21 32 25.5	+ 25.22	8 43.64	0.944	19 29 17.54
Thur.	14	19 42 20.09	10.774	21 22 7.8	26.25	9 5.99	0.919	19 33 14.10
Frid.	15	19 46 38.38	10.747	21 11 25.4	27.28	9 27.73	0.892	19 37 10.65
Sat.	16	19 50 56.02	10.720	21 0 18.6	+ 28.30	9 48.81	0.864	19 41 7.21
SUN.	17	19 55 12.99	10.693	20 48 47.6	29.30	10 9.22	0.836	19 45 3.77
Mon.	18	19 59 29.27	10.664	20 36 52.8	30.28	10 28.95	0.807	19 49 0.32
Tues.	19	20 3 44.85	10.634	20 24 34.7	+ 31.24	10 47.97	0.777	19 52 56.88
Wed.	20	20 7 59.71	10.603	20 11 53.4	32.20	11 6.27	0.747	19 56 53.44
Thur.	21	20 12 13.82	10.572	19 58 49.3	33.14	11 23.82	0.715	20 0 50.00
Frid.	22	20 16 27.16	10.540	19 45 22.9	+ 34.06	11 40.61	0.683	20 4 46.55
Sat.	23	20 20 39.74	10.508	19 31 34.5	34.98	11 56.63	0.651	20 8 43.11
SUN.	24	20 24 51.53	10.474	19 17 24.3	35.88	12 11.86	0.618	20 12 39.67
Mon.	25	20 29 2.52	10.440	19 2 52.7	+ 36.75	12 26.29	0.584	20 16 36.22
Tues.	26	20 33 12.69	10.406	18 48 0.3	37.61	12 39.90	0.550	20 20 32.78
Wed.	27	20 37 22.03	10.372	18 32 47.4	38.46	12 52.69	0.515	20 24 29.34
Thur.	28	20 41 30.54	10.337	18 17 14.5	+ 39.29	13 4.64	0.481	20 28 25.89
Frid.	29	20 45 38.21	10.302	18 1 21.8	40.10	13 15.76	0.446	20 32 22.45
Sat.	30	20 49 45.04	10.267	17 45 9.8	40.90	13 26.04	0.411	20 36 19.00
SUN.	31	20 53 51.04	10.233	17 28 38.9	41.67	13 35.48	0.376	20 40 15.56
Mon.	32	20 57 56.21	10.198	S. 17 11 49.6	+ 42.44	13 44.09	0.341	20 44 12.12

Note.—The semidiameter for mean noon may be assumed the same as that for apparent noon.
The sign + prefixed to the hourly change of declination indicates that south declinations are decreasing.

Diff. for 1 Hour,
+ $9^{s}.8565$.
(Table III.)

AT GREENWICH MEAN NOON.

Day of the Month.	Day of the Year.	THE SUN'S TRUE LONGITUDE. λ	THE SUN'S TRUE LONGITUDE. λ′	Diff. for 1 Hour.	LATITUDE.	Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.
		° ′ ″	′ ″	″	″			h m s
1	1	280 28 21.8	28 38.5	152.88	− 0.70	9.992 6590	− 1.9	5 17 9.06
2	2	281 29 30.9	29 47.3	152.87	0.60	9.992 6557	− 0.8	5 13 13.15
3	3	282 30 39.6	30 55.9	152.86	0.47	9.992 6550	+ 0.3	5 9 17.24
4	4	283 31 48.2	32 4.3	152.85	− 0.34	9.992 6571	+ 1.5	5 5 21.32
5	5	284 32 56.5	33 12.4	152.84	0.20	9.992 6620	2.6	5 1 25.41
6	6	285 34 4.7	34 20.4	152.84	− 0.08	9.992 6698	3.8	4 57 29.50
7	7	286 35 12.7	35 28.2	152.83	+ 0.05	9.992 6804	+ 5.0	4 53 33.59
8	8	287 36 20.6	36 35.9	152.83	0.16	9.992 6938	6.2	4 49 37.67
9	9	288 37 28.3	37 43.5	152.82	0.24	9.992 7099	7.3	4 45 41.76
10	10	289 38 35.9	38 50.9	152.82	+ 0.30	9.992 7288	+ 8.4	4 41 45.85
11	11	290 39 43.4	39 58.2	152.81	0.34	9.992 7503	9.5	4 37 49.94
12	12	291 40 50.7	41 5.4	152.81	0.34	9.992 7743	10.5	4 33 54.03
13	13	292 41 58.0	42 12.4	152.80	+ 0.34	9.992 8008	+ 11.5	4 29 58.12
14	14	293 43 5.0	43 19.2	152.79	0.29	9.992 8297	12.5	4 26 2.20
15	15	294 44 11.8	44 25.9	152.78	0.23	9.992 8608	13.4	4 22 6.29
16	16	295 45 18.4	45 32.4	152.77	+ 0.13	9.992 8940	+ 14.3	4 18 10.38
17	17	296 46 24.8	46 38.6	152.76	+ 0.02	9.992 9292	15.1	4 14 14.47
18	18	297 47 30.9	47 44.5	152.75	− 0.10	9.992 9662	15.8	4 10 18.56
19	19	298 48 36.5	48 50.0	152.73	− 0.24	9.993 0050	+ 16.5	4 6 22.65
20	20	299 49 41.7	49 55.0	152.71	0.37	9.993 0455	17.2	4 2 26.74
21	21	300 50 46.3	50 59.4	152.68	0.51	9.993 0874	17.8	3 58 30.82
22	22	301 51 50.2	52 3.2	152.65	− 0.61	9.993 1307	+ 18.4	3 54 34.91
23	23	302 52 53.4	53 6.2	152.61	0.69	9.993 1755	19.0	3 50 39.00
24	24	303 53 55.6	54 8.2	152.57	0.75	9.993 2218	19.6	3 46 43.09
25	25	304 54 56.8	55 9.3	152.53	− 0.76	9.993 2696	+ 20.2	3 42 47.18
26	26	305 55 56.9	56 9.2	152.48	0.75	9.993 3189	20.9	3 38 51.27
27	27	306 56 55.9	57 8.0	152.43	0.72	9.993 3700	21.7	3 34 55.36
28	28	307 57 53.6	58 5.6	152.38	− 0.65	9.993 4230	+ 22.5	3 30 59.45
29	29	308 58 50.0	59 1.9	152.33	0.54	9.993 4780	23.3	3 27 3.54
30	30	309 59 45.2	59 56.9	152.28	0.43	9.993 5350	24.2	3 23 7.63
31	31	311 0 39.0	0 50.6	152.22	0.29	9.993 5943	25.2	3 19 11.72
32	32	312 1 31.6	1 43.0	152.16	− 0.16	9.993 6558	+ 26.1	3 15 15.81

Note.—The numbers in column λ correspond to the true equinox of the date; in column λ′ to the mean equinox of January $0^d.0$.

Diff. for 1 Hour, $-9^s.8296$.
(Table II.)

GREENWICH MEAN TIME.

THE MOON'S

Day of the Month.	SEMIDIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
	′ ″	′ ″	′ ″	″	′ ″	″	h m	m	d
1	15 48.6	15 44.8	57 55.7	− 1.18	57 41.5	− 1.19	8 7.1	2.06	9.0
2	15 40.9	15 37.0	57 27.2	1.20	57 12.7	1.20	8 57.2	2.12	10.0
3	15 33.0	15 29.1	56 58.2	1.21	56 43.7	1.21	9 48.9	2.19	11.0
4	15 25.1	15 21.1	56 29.1	− 1.21	56 14.6	− 1.20	10 41.9	2.23	12.0
5	15 17.2	15 13.4	56 0.3	1.19	55 46.2	1.17	11 35.5	2.23	13.0
6	15 9.6	15 6.0	55 32.3	1.14	55 18.8	1.10	12 28.5	2.18	14.0
7	15 2.5	14 59.1	55 5.9	− 1.05	54 53.8	− 0.97	13 19.6	2.08	15.0
8	14 56.1	14 53.4	54 42.7	0.88	54 32.6	0.78	14 8.2	1.97	16.0
9	14 51.0	14 49.0	54 23.8	0.66	54 16.6	0.53	14 54.1	1.86	17.0
10	14 47.5	14 46.5	54 11.1	− 0.38	54 7.4	− 0.22	15 37.5	1.77	18.0
11	14 46.1	14 46.3	54 5.8	− 0.04	54 6.5	+ 0.15	16 19.1	1.71	19.0
12	14 47.1	14 48.5	54 9.4	+ 0.35	54 14.8	0.56	16 59.7	1.69	20.0
13	14 50.7	14 53.6	54 22.8	+ 0.77	54 33.3	+ 0.98	17 40.4	1.71	21.0
14	14 57.1	15 1.4	54 46.4	1.20	55 2.0	1.40	18 22.1	1.78	22.0
15	15 6.3	15 11.8	55 20.1	1.60	55 40.5	1.78	19 6.1	1.89	23.0
16	15 17.9	15 24.6	56 3.0	+ 1.95	56 27.4	+ 2.09	19 53.4	2.05	24.0
17	15 31.7	15 39.0	56 53.2	2.20	57 20.2	2.27	20 44.9	2.24	25.0
18	15 46.5	15 54.0	57 47.7	2.30	58 15.3	2.28	21 40.9	2.43	26.0
19	16 1.4	16 8.4	58 42.4	+ 2.20	59 8.3	+ 2.08	22 41.0	2.56	27.0
20	16 15.0	16 20.9	59 32.3	1.90	59 53.9	1.67	23 43.3	2.61	28.0
21	16 25.9	16 30.0	60 12.5	1.40	60 27.5	1.08	6	. . .	29.0
22	16 33.0	16 34.9	60 38.5	+ 0.75	60 45.4	+ 0.39	0 45.5	2.55	0.5
23	16 35.6	16 35.1	60 47.9	+ 0.03	60 46.3	− 0.31	1 45.4	2.43	1.5
24	16 33.5	16 30.9	60 40.5	− 0.63	60 31.1	0.92	2 42.0	2.29	2.5
25	16 27.5	16 23.3	60 18.4	− 1.18	60 2.9	− 1.38	3 35.3	2.16	3.5
26	16 18.5	16 13.2	59 45.1	1.55	59 25.7	1.67	4 26.2	2.08	4.5
27	16 7.6	16 1.8	59 5.1	1.75	58 43.8	1.78	5 15.6	2.05	5.5
28	15 55.9	15 50.1	58 22.3	− 1.80	58 0.8	− 1.77	6 4.8	2.06	6.5
29	15 44.3	15 38.8	57 39.7	1.73	57 19.3	1.67	6 54.5	2.09	7.5
30	15 33.4	15 28.3	56 59.6	1.60	56 40.8	1.52	7 45.4	2.15	8.5
31	15 23.4	15 18.9	56 23.0	1.44	56 6.3	1.35	8 37.4	2.19	9.5
32	15 14.6	15 10.6	55 50.5	− 1.27	55 35.8	− 1.18	9 30.2	2.20	10.5

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute
	FRIDAY 1.					SUNDAY 3.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	2 33 3.47	2.1352	N.11 0 20.0	12.625	0	4 18 9.05	2.2499	N.19 34 2.9	8.407
1	2 35 11.63	2.1370	11 12 55.6	12.561	1	4 20 24.12	2.2524	19 42 24.1	8.297
2	2 37 19.91	2.1388	11 25 27.3	12.495	2	4 22 39.34	2.2549	19 50 38.6	8.186
3	2 39 28.29	2.1406	11 37 55.0	12.428	3	4 24 54.71	2.2574	19 58 46.4	8.074
4	2 41 36.78	2.1425	11 50 18.7	12.361	4	4 27 10.23	2.2598	20 6 47.5	7.962
5	2 43 45.39	2.1445	12 2 38.3	12.292	5	4 29 25.89	2.2622	20 14 41.8	7.848
6	2 45 54.12	2.1465	12 14 53.8	12.223	6	4 31 41.69	2.2645	20 22 29.3	7.734
7	2 48 2.97	2.1485	12 27 5.1	12.153	7	4 33 57.63	2.2669	20 30 9.9	7.618
8	2 50 11.94	2.1506	12 39 12.2	12.082	8	4 36 13.72	2.2692	20 37 43.5	7.502
9	2 52 21.04	2.1527	12 51 14.9	12.009	9	4 38 29.94	2.2715	20 45 10.2	7.387
10	2 54 30.26	2.1548	13 3 13.3	11.935	10	4 40 46.30	2.2737	20 52 29.9	7.270
11	2 56 39.62	2.1570	13 15 7.1	11.860	11	4 43 2.79	2.2759	20 59 42.6	7.152
12	2 58 49.10	2.1592	13 26 56.5	11.785	12	4 45 19.41	2.2781	21 6 48.2	7.034
13	3 0 58.72	2.1614	13 38 41.3	11.707	13	4 47 36.16	2.2802	21 13 46.7	6.915
14	3 3 8.47	2.1637	13 50 21.4	11.629	14	4 49 53.04	2.2824	21 20 38.0	6.795
15	3 5 18.36	2.1659	14 1 56.8	11.551	15	4 52 10.05	2.2844	21 27 22.1	6.674
16	3 7 28.38	2.1682	14 13 27.5	11.471	16	4 54 27.17	2.2864	21 33 58.9	6.553
17	3 9 38.55	2.1707	14 24 53.3	11.390	17	4 56 44.42	2.2884	21 40 28.5	6.432
18	3 11 48.86	2.1731	14 36 14.3	11.308	18	4 59 1.78	2.2902	21 46 50.8	6.310
19	3 13 59.32	2.1755	14 47 30.3	11.225	19	5 1 19.25	2.2921	21 53 5.7	6.187
20	3 16 9.92	2.1778	14 58 41.3	11.141	20	5 3 36.83	2.2939	21 59 13.2	6.063
21	3 18 20.66	2.1802	15 9 47.2	11.057	21	5 5 54.52	2.2957	22 5 13.3	5.940
22	3 20 31.55	2.1828	15 20 48.1	10.971	22	5 8 12.32	2.2974	22 11 6.0	5.816
23	3 22 42.60	2.1853	N.15 31 43.7	10.883	23	5 10 30.21	2.2990	N.22 16 51.2	5.691
	SATURDAY 2.					MONDAY 4.			
0	3 24 53.79	2.1878	N.15 42 34.1	10.796	0	5 12 48.20	2.3007	N.22 22 28.9	5.566
1	3 27 5.14	2.1904	15 53 19.2	10.707	1	5 15 6.29	2.3022	22 27 59.1	5.439
2	3 29 16.64	2.1929	16 3 58.9	10.617	2	5 17 24.47	2.3037	22 33 21.6	5.312
3	3 31 28.29	2.1955	16 14 33.2	10.526	3	5 19 42.74	2.3052	22 38 36.6	5.186
4	3 33 40.10	2.1981	16 25 2.0	10.434	4	5 22 1.09	2.3065	22 43 43.9	5.058
5	3 35 52.06	2.2006	16 35 25.3	10.342	5	5 24 19.52	2.3078	22 48 43.6	4.932
6	3 38 4.17	2.2032	16 45 43.0	10.248	6	5 26 38.03	2.3091	22 53 35.7	4.803
7	3 40 16.45	2.2059	16 55 55.1	10.154	7	5 28 56.61	2.3102	22 58 20.0	4.674
8	3 42 28.88	2.2084	17 6 1.5	10.058	8	5 31 15.26	2.3113	23 2 56.6	4.545
9	3 44 41.46	2.2110	17 16 2.1	9.961	9	5 33 33.97	2.3124	23 7 25.4	4.416
10	3 46 54.20	2.2137	17 25 56.8	9.863	10	5 35 52.75	2.3134	23 11 46.5	4.286
11	3 49 7.10	2.2163	17 35 45.7	9.766	11	5 38 11.58	2.3142	23 15 59.7	4.156
12	3 51 20.16	2.2190	17 45 28.7	9.667	12	5 40 30.46	2.3152	23 20 5.2	4.027
13	3 53 33.38	2.2216	17 55 5.7	9.567	13	5 42 49.40	2.3160	23 24 2.9	3.896
14	3 55 46.75	2.2242	18 4 36.7	9.466	14	5 45 8.38	2.3167	23 27 52.7	3.764
15	3 58 0.28	2.2268	18 14 1.6	9.363	15	5 47 27.40	2.3172	23 31 34.6	3.633
16	4 0 13.97	2.2295	18 23 20.3	9.260	16	5 49 46.45	2.3178	23 35 8.7	3.502
17	4 2 27.82	2.2321	18 32 32.8	9.157	17	5 52 5.54	2.3183	23 38 34.9	3.371
18	4 4 41.82	2.2346	18 41 39.1	9.052	18	5 54 24.65	2.3187	23 41 53.2	3.239
19	4 6 55.97	2.2372	18 50 39.1	8.947	19	5 56 43.79	2.3191	23 45 3.6	3.107
20	4 9 10.28	2.2398	18 59 32.8	8.842	20	5 59 2.94	2.3193	23 48 6.1	2.975
21	4 11 24.75	2.2423	19 8 20.1	8.734	21	6 1 22.11	2.3195	23 51 0.6	2.842
22	4 13 39.36	2.2448	19 17 0.9	8.626	22	6 3 41.28	2.3196	23 53 47.2	2.711
23	4 15 54.13	2.2474	19 25 35.2	8.517	23	6 6 0.46	2.3197	23 56 25.9	2.578
24	4 18 9.05	2.2499	N.19 34 2.9	8.407	24	6 8 19.64	2.3196	N.23 58 56.6	2.446

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.			Diff. for 1 Minute.	Declination.			Diff. for 1 Minute.
TUESDAY 5.								
	h	m	s	s	°	′	″	″
0	6	8	19.64	2.3196	N.23	58	56.6	2.446
1	6	10	38.81	2.3194	24	1	19.4	2.313
2	6	12	57.97	2.3192	24	3	34.2	2.180
3	6	15	17.12	2.3190	24	5	41.0	2.047
4	6	17	36.25	2.3186	24	7	39.9	1.915
5	6	19	55.35	2.3181	24	9	30.8	1.782
6	6	22	14.42	2.3176	24	11	13.8	1.650
7	6	24	33.46	2.3170	24	12	48.8	1.517
8	6	26	52.46	2.3163	24	14	15.8	1.384
9	6	29	11.42	2.3156	24	15	34.9	1.252
10	6	31	30.33	2.3147	24	16	46.1	1.120
11	6	33	49.18	2.3137	24	17	49.3	0.987
12	6	36	7.98	2.3127	24	18	44.5	0.854
13	6	38	26.71	2.3117	24	19	31.8	0.722
14	6	40	45.38	2.3105	24	20	11.2	0.591
15	6	43	3.97	2.3092	24	20	42.7	0.459
16	6	45	22.49	2.3079	24	21	6.3	0.328
17	6	47	40.92	2.3064	24	21	22.1	0.197
18	6	49	59.26	2.3050	24	21	29.9	+0.065
19	6	52	17.52	2.3035	24	21	29.9	−0.065
20	6	54	35.68	2.3018	24	21	22.1	0.195
21	6	56	53.74	2.3001	24	21	6.5	0.325
22	6	59	11.69	2.2982	24	20	43.1	0.455
23	7	1	29.53	2.2964	N.24	20	11.9	0.585
WEDNESDAY 6.								
0	7	3	47.26	2.2945	N.24	19	32.9	0.714
1	7	6	4.87	2.2924	24	18	46.2	0.843
2	7	8	22.35	2.2902	24	17	51.7	0.972
3	7	10	39.70	2.2881	24	16	49.6	1.099
4	7	12	56.92	2.2858	24	15	39.8	1.227
5	7	15	14.00	2.2835	24	14	22.3	1.355
6	7	17	30.94	2.2811	24	12	57.2	1.482
7	7	19	47.73	2.2787	24	11	24.5	1.607
8	7	22	4.38	2.2762	24	9	44.3	1.733
9	7	24	20.87	2.2735	24	7	56.5	1.859
10	7	26	37.20	2.2708	24	6	1.2	1.983
11	7	28	53.37	2.2681	24	3	58.5	2.107
12	7	31	9.37	2.2652	24	1	48.3	2.232
13	7	33	25.20	2.2623	23	59	30.7	2.355
14	7	35	40.85	2.2594	23	57	5.7	2.478
15	7	37	56.33	2.2564	23	54	33.3	2.601
16	7	40	11.62	2.2533	23	51	53.6	2.722
17	7	42	26.73	2.2502	23	49	6.7	2.842
18	7	44	41.65	2.2471	23	46	12.5	2.963
19	7	46	56.38	2.2438	23	43	11.1	3.083
20	7	49	10.91	2.2405	23	40	2.5	3.202
21	7	51	25.24	2.2372	23	36	46.9	3.320
22	7	53	39.37	2.2337	23	33	24.1	3.439
23	7	55	53.29	2.2302	23	29	54.2	3.556
24	7	58	7.00	2.2267	N.23	26	17.4	3.672

Hour.	Right Ascension.			Diff. for 1 Minute.	Declination.			Diff. for 1 Minute.
THURSDAY 7.								
	h	m	s	s	°	′	″	″
0	7	58	7.00	2.2267	N.23	26	17.4	3.672
1	8	0	20.50	2.2232	23	22	33.6	3.787
2	8	2	33.78	2.2196	23	18	42.9	3.903
3	8	4	46.85	2.2160	23	14	45.2	4.018
4	8	6	59.70	2.2122	23	10	40.7	4.132
5	8	9	12.32	2.2084	23	6	29.4	4.244
6	8	11	24.71	2.2047	23	2	11.4	4.356
7	8	13	36.88	2.2008	22	57	46.7	4.467
8	8	15	48.81	2.1969	22	53	15.3	4.579
9	8	18	0.51	2.1931	22	48	37.2	4.689
10	8	20	11.98	2.1891	22	43	52.6	4.797
11	8	22	23.21	2.1851	22	39	1.5	4.907
12	8	24	34.19	2.1811	22	34	3.8	5.015
13	8	26	44.93	2.1770	22	28	59.7	5.121
14	8	28	55.43	2.1729	22	23	49.3	5.227
15	8	31	5.68	2.1688	22	18	32.5	5.332
16	8	33	15.68	2.1647	22	13	9.4	5.437
17	8	35	25.44	2.1605	22	7	40.0	5.541
18	8	37	34.95	2.1563	22	2	4.5	5.643
19	8	39	44.20	2.1520	21	56	22.8	5.746
20	8	41	53.19	2.1477	21	50	35.0	5.847
21	8	44	1.93	2.1436	21	44	41.2	5.947
22	8	46	10.41	2.1393	21	38	41.3	6.047
23	8	48	18.64	2.1349	N.21	32	35.5	6.146
FRIDAY 8.								
0	8	50	26.61	2.1307	N.21	26	23.8	6.244
1	8	52	34.32	2.1263	21	20	6.2	6.341
2	8	54	41.77	2.1219	21	13	42.9	6.437
3	8	56	48.96	2.1177	21	7	13.8	6.532
4	8	58	55.88	2.1133	21	0	39.0	6.627
5	9	1	2.54	2.1088	20	53	58.5	6.721
6	9	3	8.94	2.1044	20	47	12.5	6.813
7	9	5	15.07	2.1000	20	40	20.9	6.906
8	9	7	20.94	2.0957	20	33	23.8	6.997
9	9	9	26.55	2.0913	20	26	21.3	7.087
10	9	11	31.90	2.0869	20	19	13.4	7.177
11	9	13	36.98	2.0824	20	12	0.1	7.265
12	9	15	41.79	2.0780	20	4	41.6	7.352
13	9	17	46.34	2.0737	19	57	17.8	7.439
14	9	19	50.63	2.0692	19	49	48.9	7.525
15	9	21	54.65	2.0648	19	42	14.8	7.610
16	9	23	58.41	2.0604	19	34	35.7	7.694
17	9	26	1.90	2.0560	19	26	51.5	7.777
18	9	28	5.13	2.0517	19	19	2.4	7.860
19	9	30	8.10	2.0473	19	11	8.3	7.942
20	9	32	10.81	2.0430	19	3	9.4	8.022
21	9	34	13.26	2.0386	18	55	5.6	8.102
22	9	36	15.44	2.0342	18	46	57.1	8.181
23	9	38	17.37	2.0300	18	38	43.9	8.259
24	9	40	19.04	2.0257	N.18	30	26.0	8.337

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	SATURDAY 9.					MONDAY 11.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	9 40 19.04	2.0257	N.18 30 26.0	8.337	0	11 13 7.95	1.8565	N.10 36 48.0	11.100
1	9 42 20.45	2.0214	18 22 3.5	8.413	1	11 14 59.27	1.8541	10 25 40.8	11.139
2	9 44 21.61	2.0172	18 13 36.4	8.488	2	11 16 50.44	1.8517	10 14 31.3	11.177
3	9 46 22.51	2.0128	18 5 4.9	8.563	3	11 18 41.47	1.8493	10 3 19.5	11.216
4	9 48 23.15	2.0086	17 56 28.8	8.638	4	11 20 32.36	1.8470	9 52 5.4	11.253
5	9 50 23.54	2.0044	17 47 48.3	8.711	5	11 22 23.11	1.8448	9 40 49.1	11.289
6	9 52 23.68	2.0002	17 39 3.5	8.782	6	11 24 13.74	1.8427	9 29 30.7	11.325
7	9 54 23.57	1.9961	17 30 14.4	8.853	7	11 26 4.24	1.8406	9 18 10.1	11.361
8	9 56 23.21	1.9920	17 21 21.1	8.924	8	11 27 54.61	1.8385	9 6 47.4	11.396
9	9 58 22.61	1.9879	17 12 23.5	8.995	9	11 29 44.86	1.8366	8 55 22.6	11.430
10	10 0 21.76	1.9837	17 3 21.7	9.063	10	11 31 35.00	1.8347	8 43 55.8	11.463
11	10 2 20.66	1.9797	16 54 15.9	9.131	11	11 33 25.02	1.8327	8 32 27.0	11.496
12	10 4 19.32	1.9757	16 45 6.0	9.198	12	11 35 14.93	1.8309	8 20 56.3	11.527
13	10 6 17.74	1.9717	16 35 52.1	9.265	13	11 37 4.73	1.8292	8 9 23.7	11.559
14	10 8 15.92	1.9677	16 26 34.2	9.331	14	11 38 54.43	1.8275	7 57 49.2	11.590
15	10 10 13.87	1.9638	16 17 12.4	9.395	15	11 40 44.03	1.8258	7 46 12.9	11.620
16	10 12 11.58	1.9598	16 7 46.8	9.459	16	11 42 33.53	1.8242	7 34 34.8	11.649
17	10 14 9.05	1.9560	15 58 17.3	9.522	17	11 44 22.94	1.8227	7 22 55.0	11.678
18	10 16 6.30	1.9522	15 48 44.1	9.584	18	11 46 12.26	1.8212	7 11 13.4	11.707
19	10 18 3.31	1.9483	15 39 7.2	9.646	19	11 48 1.49	1.8198	6 59 30.2	11.734
20	10 20 0.10	1.9447	15 29 26.6	9.707	20	11 49 50.64	1.8185	6 47 45.3	11.762
21	10 21 56.67	1.9409	15 19 42.4	9.767	21	11 51 39.71	1.8172	6 35 58.8	11.787
22	10 23 53.01	1.9372	15 9 54.6	9.826	22	11 53 28.71	1.8161	6 24 10.8	11.812
23	10 25 49.13	1.9335	N.15 0 3.3	9.884	23	11 55 17.64	1.8149	N. 6 12 21.3	11.838
	SUNDAY 10.					TUESDAY 12.			
0	10 27 45.03	1.9299	N.14 50 8.5	9.942	0	11 57 6.50	1.8138	N. 6 0 30.2	11.863
1	10 29 40.72	1.9263	14 40 10.3	9.998	1	11 58 55.30	1.8127	5 48 37.7	11.887
2	10 31 36.19	1.9227	14 30 8.7	10.055	2	12 0 44.03	1.8117	5 36 43.8	11.910
3	10 33 31.45	1.9193	14 20 3.7	10.110	3	12 2 32.71	1.8109	5 24 48.5	11.932
4	10 35 26.51	1.9159	14 9 55.5	10.164	4	12 4 21.34	1.8101	5 12 51.9	11.955
5	10 37 21.36	1.9124	13 59 44.0	10.218	5	12 6 9.92	1.8093	5 0 53.9	11.977
6	10 39 16.00	1.9090	13 49 29.3	10.272	6	12 7 58.45	1.8086	4 48 54.7	11.997
7	10 41 10.44	1.9057	13 39 11.4	10.324	7	12 9 46.95	1.8079	4 36 54.3	12.017
8	10 43 4.69	1.9025	13 28 50.4	10.375	8	12 11 35.40	1.8073	4 24 52.6	12.037
9	10 44 58.74	1.8992	13 18 26.4	10.425	9	12 13 23.82	1.8068	4 12 49.8	12.056
10	10 46 52.60	1.8960	13 7 59.4	10.475	10	12 15 12.22	1.8063	4 0 45.9	12.074
11	10 48 46.26	1.8928	12 57 29.4	10.525	11	12 17 0.58	1.8059	3 48 40.9	12.092
12	10 50 39.74	1.8898	12 46 56.4	10.573	12	12 18 48.93	1.8057	3 36 34.8	12.110
13	10 52 33.04	1.8867	12 36 20.6	10.621	13	12 20 37.26	1.8053	3 24 27.7	12.126
14	10 54 26.15	1.8837	12 25 41.9	10.668	14	12 22 25.57	1.8052	3 12 19.7	12.142
15	10 56 19.08	1.8807	12 15 0.4	10.714	15	12 24 13.88	1.8051	3 0 10.7	12.157
16	10 58 11.84	1.8779	12 4 16.2	10.760	16	12 26 2.18	1.8050	2 48 0.8	12.172
17	11 0 4.43	1.8751	11 53 29.2	10.805	17	12 27 50.48	1.8050	2 35 50.0	12.187
18	11 1 56.85	1.8722	11 42 39.6	10.849	18	12 29 38.78	1.8050	2 23 38.4	12.200
19	11 3 49.10	1.8694	11 31 47.3	10.892	19	12 31 27.08	1.8052	2 11 26.0	12.213
20	11 5 41.18	1.8667	11 20 52.5	10.935	20	12 33 15.40	1.8054	1 59 12.8	12.226
21	11 7 33.11	1.8642	11 9 55.1	10.977	21	12 35 3.73	1.8056	1 46 58.9	12.237
22	11 9 24.88	1.8615	10 58 55.2	11.019	22	12 36 52.07	1.8059	1 34 44.3	12.248
23	11 11 16.49	1.8589	10 47 52.8	11.060	23	12 38 40.44	1.8064	1 22 29.1	12.259
24	11 13 7.95	1.8565	N.10 36 48.0	11.100	24	12 40 28.84	1.8069	N. 1 10 13.2	12.269

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	WEDNESDAY 13.					FRIDAY 15.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	12 40 28.84	1.8069	N. 1 10 13.2	12.269	0	14 9 5.06	1.9124	S. 8 38 2.3	11.977
1	12 42 17.27	1.8074	0 57 56.8	12.278	1	14 10 59.92	1.9163	8 50 0.2	11.953
2	12 44 5.73	1.8080	0 45 39.8	12.287	2	14 12 55.02	1.9203	9 1 56.7	11.929
3	12 45 54.23	1.8087	0 33 22.4	12.295	3	14 14 50.36	1.9245	9 13 51.7	11.903
4	12 47 42.77	1.8094	0 21 4.4	12.303	4	14 16 45.96	1.9287	9 25 45.0	11.876
5	12 49 31.36	1.8102	N. 0 8 46.0	12.309	5	14 18 41.80	1.9328	9 37 36.8	11.849
6	12 51 20.00	1.8111	S. 0 3 32.7	12.315	6	14 20 37.90	1.9372	9 49 26.9	11.820
7	12 53 8.69	1.8121	0 15 51.8	12.322	7	14 22 34.26	1.9416	10 1 15.2	11.790
8	12 54 57.45	1.8132	0 28 11.3	12.327	8	14 24 30.89	1.9461	10 13 1.7	11.760
9	12 56 46.27	1.8142	0 40 31.0	12.331	9	14 26 27.79	1.9506	10 24 46.4	11.729
10	12 58 35.15	1.8153	0 52 51.0	12.335	10	14 28 24.96	1.9552	10 36 29.2	11.697
11	13 0 24.11	1.8167	1 5 11.2	12.337	11	14 30 22.41	1.9598	10 48 10.1	11.664
12	13 2 13.15	1.8179	1 17 31.5	12.340	12	14 32 20.14	1.9646	10 59 48.9	11.630
13	13 4 2.26	1.8192	1 29 52.0	12.342	13	14 34 18.16	1.9694	11 11 25.7	11.595
14	13 5 51.46	1.8207	1 42 12.6	12.343	14	14 36 16.47	1.9742	11 23 0.3	11.559
15	13 7 40.75	1.8222	1 54 33.2	12.344	15	14 38 15.07	1.9792	11 34 32.8	11.522
16	13 9 30.13	1.8238	2 6 53.9	12.344	16	14 40 13.97	1.9842	11 46 3.0	11.484
17	13 11 19.61	1.8255	2 19 14.5	12.343	17	14 42 13.18	1.9893	11 57 30.9	11.446
18	13 13 9.19	1.8272	2 31 35.1	12.342	18	14 44 12.69	1.9944	12 8 56.5	11.407
19	13 14 58.87	1.8290	2 43 55.6	12.341	19	14 46 12.51	1.9997	12 20 19.7	11.366
20	13 16 48.67	1.8309	2 56 16.0	12.338	20	14 48 12.65	2.0050	12 31 40.4	11.323
21	13 18 38.58	1.8327	3 8 36.2	12.335	21	14 50 13.11	2.0103	12 42 58.5	11.280
22	13 20 28.60	1.8347	3 20 56.2	12.331	22	14 52 13.89	2.0157	12 54 14.0	11.237
23	13 22 18.75	1.8369	S. 3 33 15.9	12.326	23	14 54 14.99	2.0212	S. 13 5 26.9	11.192
	THURSDAY 14.					SATURDAY 16.			
0	13 24 9.03	1.8391	S. 3 45 35.3	12.321	0	14 56 16.43	2.0267	S. 13 16 37.1	11.146
1	13 25 59.44	1.8412	3 57 54.4	12.315	1	14 58 18.20	2.0323	13 27 44.4	11.098
2	13 27 49.98	1.8435	4 10 13.1	12.307	2	15 0 20.31	2.0380	13 38 48.9	11.051
3	13 29 40.66	1.8459	4 22 31.3	12.300	3	15 2 22.76	2.0437	13 49 50.5	11.001
4	13 31 31.49	1.8484	4 34 49.1	12.293	4	15 4 25.55	2.0495	14 0 49.0	10.950
5	13 33 22.47	1.8509	4 47 6.5	12.285	5	15 6 28.70	2.0554	14 11 44.5	10.899
6	13 35 13.60	1.8535	4 59 23.3	12.275	6	15 8 32.20	2.0613	14 22 36.9	10.847
7	13 37 4.89	1.8562	5 11 39.5	12.264	7	15 10 36.06	2.0672	14 33 26.1	10.792
8	13 38 56.34	1.8588	5 23 55.0	12.253	8	15 12 40.27	2.0732	14 44 12.0	10.737
9	13 40 47.95	1.8617	5 36 9.9	12.242	9	15 14 44.85	2.0793	14 54 54.6	10.682
10	13 42 39.74	1.8646	5 48 24.1	12.231	10	15 16 49.79	2.0855	15 5 33.8	10.624
11	13 44 31.70	1.8675	6 0 37.6	12.217	11	15 18 55.11	2.0917	15 16 9.5	10.566
12	13 46 23.84	1.8705	6 12 50.2	12.203	12	15 21 0.80	2.0980	15 26 41.7	10.506
13	13 48 16.16	1.8736	6 25 2.0	12.189	13	15 23 6.87	2.1042	15 37 10.2	10.445
14	13 50 8.67	1.8767	6 37 12.9	12.173	14	15 25 13.31	2.1106	15 47 35.1	10.383
15	13 52 1.37	1.8800	6 49 22.8	12.157	15	15 27 20.14	2.1171	15 57 56.2	10.319
16	13 53 54.27	1.8833	7 1 31.8	12.141	16	15 29 27.36	2.1236	16 8 13.4	10.254
17	13 55 47.37	1.8867	7 13 39.7	12.123	17	15 31 34.97	2.1301	16 18 26.7	10.188
18	13 57 40.68	1.8902	7 25 46.6	12.105	18	15 33 42.97	2.1367	16 28 36.0	10.122
19	13 59 34.19	1.8937	7 37 52.3	12.086	19	15 35 51.37	2.1432	16 38 41.3	10.053
20	14 1 27.92	1.8973	7 49 56.9	12.066	20	15 38 0.16	2.1498	16 48 42.4	9.983
21	14 3 21.87	1.9010	8 2 0.2	12.044	21	15 40 9.35	2.1566	16 58 39.3	9.912
22	14 5 16.04	1.9047	8 14 2.2	12.022	22	15 42 18.95	2.1634	17 8 31.9	9.840
23	14 7 10.43	1.9085	8 26 2.9	12.001	23	15 44 28.96	2.1702	17 18 20.1	9.767
24	14 9 5.06	1.9124	S. 8 38 2.3	11.977	24	15 46 39.37	2.1769	S. 17 28 3.9	9.692

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	SUNDAY 17.					TUESDAY 19.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	15 46 39.37	2.1769	S. 17 28 3.9	9.692	0	17 39 18.57	2.5117	S. 23 19 51.8	4.407
1	15 48 50.19	2.1838	17 37 43.1	9.615	1	17 41 49.46	2.5178	23 24 11.9	4.262
2	15 51 1.43	2.1907	17 47 17.7	9.537	2	17 44 20.71	2.5237	23 28 23.3	4.116
3	15 53 13.08	2.1976	17 56 47.6	9.458	3	17 46 52.31	2.5297	23 32 25.8	3.967
4	15 55 25.14	2.2046	18 6 12.7	9.377	4	17 49 24.27	2.5356	23 36 19.4	3.819
5	15 57 37.63	2.2117	18 15 32.9	9.296	5	17 51 56.58	2.5412	23 40 4.1	3.669
6	15 59 50.54	2.2187	18 24 48.2	9.212	6	17 54 29.22	2.5468	23 43 39.7	3.517
7	16 2 3.87	2.2257	18 33 58.4	9.128	7	17 57 2.20	2.5524	23 47 6.1	3.364
8	16 4 17.62	2.2328	18 43 3.5	9.042	8	17 59 35.51	2.5578	23 50 23.4	3.211
9	16 6 31.81	2.2400	18 52 3.5	8.955	9	18 2 9.14	2.5632	23 53 31.4	3.056
10	16 8 46.42	2.2470	19 0 58.2	8.867	10	18 4 43.09	2.5683	23 56 30.1	2.900
11	16 11 1.45	2.2542	19 9 47.5	8.776	11	18 7 17.34	2.5734	23 59 19.4	2.742
12	16 13 16.92	2.2614	19 18 31.3	8.684	12	18 9 51.90	2.5785	24 1 59.2	2.584
13	16 15 32.82	2.2686	19 27 9.6	8.592	13	18 12 26.76	2.5833	24 4 29.5	2.425
14	16 17 49.15	2.2757	19 35 42.3	8.497	14	18 15 1.90	2.5881	24 6 50.2	2.264
15	16 20 5.91	2.2830	19 44 9.2	8.400	15	18 17 37.33	2.5927	24 9 1.2	2.102
16	16 22 23.11	2.2902	19 52 30.3	8.302	16	18 20 13.03	2.5972	24 11 2.5	1.940
17	16 24 40.74	2.2974	20 0 45.5	8.204	17	18 22 48.99	2.6015	24 12 54.0	1.777
18	16 26 58.80	2.3047	20 8 54.8	8.104	18	18 25 25.21	2.6058	24 14 35.7	1.612
19	16 29 17.30	2.3120	20 16 58.0	8.002	19	18 28 1.69	2.6100	24 16 7.5	1.447
20	16 31 36.24	2.3192	20 24 55.0	7.897	20	18 30 38.41	2.6140	24 17 29.4	1.282
21	16 33 55.61	2.3264	20 32 45.7	7.793	21	18 33 15.37	2.6178	24 18 41.3	1.115
22	16 36 15.41	2.3337	20 40 30.2	7.687	22	18 35 52.55	2.6215	24 19 43.2	0.947
23	16 38 35.65	2.3409	S. 20 48 8.2	7.579	23	18 38 29.95	2.6252	S. 24 20 34.9	0.778
	MONDAY 18.					WEDNESDAY 20.			
0	16 40 56.32	2.3481	S. 20 55 39.7	7.470	0	18 41 7.57	2.6287	S. 24 21 16.6	0.610
1	16 43 17.42	2.3553	21 3 4.6	7.359	1	18 43 45.39	2.6318	24 21 48.1	0.439
2	16 45 38.96	2.3626	21 10 22.8	7.247	2	18 46 23.39	2.6349	24 22 9.3	0.268
3	16 48 0.93	2.3697	21 17 34.2	7.133	3	18 49 1.58	2.6380	24 22 20.3	−0.098
4	16 50 23.33	2.3769	21 24 38.8	7.018	4	18 51 39.95	2.6409	24 22 21.1	+0.073
5	16 52 46.16	2.3841	21 31 36.4	6.901	5	18 54 18.49	2.6436	24 22 11.5	0.246
6	16 55 9.42	2.3912	21 38 26.9	6.782	6	18 56 57.18	2.6461	24 21 51.6	0.418
7	16 57 33.10	2.3982	21 45 10.3	6.663	7	18 59 36.02	2.6485	24 21 21.3	0.592
8	16 59 57.21	2.4053	21 51 46.5	6.542	8	19 2 15.00	2.6508	24 20 40.6	0.765
9	17 2 21.74	2.4123	21 58 15.4	6.420	9	19 4 54.12	2.6529	24 19 49.5	0.939
10	17 4 46.69	2.4193	22 4 36.9	6.296	10	19 7 33.35	2.6548	24 18 47.9	1.113
11	17 7 12.06	2.4263	22 10 50.9	6.170	11	19 10 12.70	2.6567	24 17 35.9	1.287
12	17 9 37.85	2.4332	22 16 57.3	6.043	12	19 12 52.15	2.6583	24 16 13.4	1.462
13	17 12 4.05	2.4401	22 22 56.1	5.915	13	19 15 31.69	2.6597	24 14 40.4	1.638
14	17 14 30.66	2.4468	22 28 47.1	5.784	14	19 18 11.32	2.6611	24 12 56.8	1.813
15	17 16 57.67	2.4536	22 34 30.2	5.653	15	19 20 51.02	2.6622	24 11 2.8	1.988
16	17 19 25.09	2.4604	22 40 5.5	5.521	16	19 23 30.79	2.6633	24 8 58.2	2.164
17	17 21 52.92	2.4671	22 45 32.7	5.386	17	19 26 10.62	2.6642	24 6 43.1	2.340
18	17 24 21.14	2.4736	22 50 51.8	5.250	18	19 28 50.49	2.6648	24 4 17.4	2.516
19	17 26 49.75	2.4801	22 56 2.7	5.113	19	19 31 30.39	2.6653	24 1 41.2	2.691
20	17 29 18.75	2.4866	23 1 5.4	4.975	20	19 34 10.33	2.6657	23 58 54.5	2.867
21	17 31 48.14	2.4930	23 5 59.7	4.835	21	19 36 50.28	2.6659	23 55 57.2	3.042
22	17 34 17.91	2.4992	23 10 45.6	4.694	22	19 39 30.24	2.6660	23 52 49.4	3.217
23	17 36 48.05	2.5055	23 15 23.0	4.552	23	19 42 10.20	2.6659	23 49 31.2	3.392
24	17 39 18.57	2.5117	S. 23 19 51.8	4.407	24	19 44 50.15	2.6657	S. 23 46 2.4	3.567

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.			Diff. for 1 Minute.	Declination.			Diff. for 1 Minute.
THURSDAY 21.								
	h	m	s	s	°	′	″	″
0	19	44	50.15	2.6657	S. 23	46	2.4	3.567
1	19	47	30.08	2.6652	23	42	23.1	3.742
2	19	50	9.98	2.6647	23	38	33.4	3.916
3	19	52	49.85	2.6640	23	34	33.2	4.090
4	19	55	29.66	2.6631	23	30	22.6	4.262
5	19	58	9.42	2.6622	23	26	1.7	4.435
6	20	0	49.12	2.6611	23	21	30.4	4.608
7	20	3	28.75	2.6597	23	16	48.7	4.781
8	20	6	8.29	2.6582	23	11	56.7	4.952
9	20	8	47.74	2.6567	23	6	54.5	5.122
10	20	11	27.09	2.6550	23	1	42.0	5.292
11	20	14	6.34	2.6531	22	56	19.4	5.462
12	20	16	45.47	2.6511	22	50	46.6	5.631
13	20	19	24.47	2.6489	22	45	3.7	5.798
14	20	22	3.34	2.6467	22	39	10.8	5.965
15	20	24	42.07	2.6443	22	33	7.9	6.132
16	20	27	20.66	2.6418	22	26	55.0	6.297
17	20	29	59.09	2.6391	22	20	32.3	6.461
18	20	32	37.35	2.6362	22	13	59.7	6.625
19	20	35	15.44	2.6334	22	7	17.3	6.787
20	20	37	53.36	2.6305	22	0	25.3	6.947
21	20	40	31.10	2.6273	21	53	23.6	7.108
22	20	43	8.64	2.6240	21	46	12.3	7.268
23	20	45	45.98	2.6207	S. 21	38	51.4	7.426
FRIDAY 22.								
0	20	48	23.12	2.6172	S. 21	31	21.2	7.582
1	20	51	0.04	2.6136	21	23	41.6	7.738
2	20	53	36.75	2.6099	21	15	52.6	7.893
3	20	56	13.23	2.6062	21	7	54.4	8.046
4	20	58	49.49	2.6023	20	59	47.1	8.197
5	21	1	25.51	2.5982	20	51	30.7	8.348
6	21	4	1.28	2.5942	20	43	5.3	8.497
7	21	6	36.81	2.5901	20	34	31.0	8.645
8	21	9	12.09	2.5858	20	25	47.9	8.791
9	21	11	47.11	2.5815	20	16	56.1	8.936
10	21	14	21.87	2.5772	20	7	55.6	9.080
11	21	16	56.37	2.5727	19	58	46.5	9.222
12	21	19	30.59	2.5681	19	49	28.9	9.362
13	21	22	4.54	2.5634	19	40	3.0	9.501
14	21	24	38.20	2.5587	19	30	28.8	9.638
15	21	27	11.58	2.5540	19	20	46.4	9.774
16	21	29	44.68	2.5492	19	10	55.9	9.908
17	21	32	17.49	2.5443	19	0	57.4	10.042
18	21	34	50.00	2.5393	18	50	50.9	10.173
19	21	37	22.21	2.5344	18	40	36.7	10.301
20	21	39	54.13	2.5294	18	30	14.8	10.429
21	21	42	25.74	2.5243	18	19	45.2	10.555
22	21	44	57.05	2.5193	18	9	8.2	10.679
23	21	47	28.06	2.5142	17	58	23.7	10.802
24	21	49	58.75	2.5089	S. 17	47	32.0	10.922

Hour.	Right Ascension.			Diff. for 1 Minute.	Declination.			Diff. for 1 Minute.
SATURDAY 23.								
	h	m	s	s	°	′	″	″
0	21	49	58.75	2.5089	S. 17	47	32.0	10.922
1	21	52	29.13	2.5037	17	36	33.1	11.041
2	21	54	59.19	2.4984	17	25	27.1	11.158
3	21	57	28.94	2.4932	17	14	14.1	11.273
4	21	59	58.38	2.4879	17	2	54.3	11.387
5	22	2	27.49	2.4826	16	51	27.7	11.499
6	22	4	56.29	2.4772	16	39	54.4	11.609
7	22	7	24.76	2.4719	16	28	14.6	11.717
8	22	9	52.92	2.4666	16	16	28.4	11.822
9	22	12	20.75	2.4612	16	4	35.9	11.927
10	22	14	48.26	2.4557	15	52	37.1	12.031
11	22	17	15.44	2.4503	15	40	32.2	12.131
12	22	19	42.30	2.4450	15	28	21.4	12.229
13	22	22	8.84	2.4396	15	16	4.7	12.327
14	22	24	35.05	2.4342	15	3	42.2	12.422
15	22	27	0.94	2.4288	14	51	14.0	12.516
16	22	29	26.51	2.4234	14	38	40.3	12.607
17	22	31	51.75	2.4181	14	26	1.2	12.697
18	22	34	16.68	2.4127	14	13	16.7	12.785
19	22	36	41.28	2.4073	14	0	27.0	12.870
20	22	39	5.56	2.4020	13	47	32.3	12.953
21	22	41	29.52	2.3967	13	34	32.6	13.036
22	22	43	53.17	2.3915	13	21	28.0	13.117
23	22	46	16.50	2.3862	S. 13	8	18.6	13.195
SUNDAY 24.								
0	22	48	39.51	2.3809	S. 12	55	4.6	13.271
1	22	51	2.21	2.3757	12	41	46.1	13.345
2	22	53	24.60	2.3706	12	28	23.2	13.418
3	22	55	46.68	2.3654	12	14	55.9	13.489
4	22	58	8.45	2.3603	12	1	24.5	13.557
5	23	0	29.92	2.3552	11	47	49.0	13.625
6	23	2	51.08	2.3502	11	34	9.5	13.690
7	23	5	11.94	2.3452	11	20	26.2	13.753
8	23	7	32.50	2.3402	11	6	39.1	13.815
9	23	9	52.77	2.3353	10	52	48.4	13.875
10	23	12	12.74	2.3303	10	38	54.1	13.933
11	23	14	32.41	2.3255	10	24	56.4	13.989
12	23	16	51.80	2.3207	10	10	55.4	14.043
13	23	19	10.90	2.3160	9	56	51.2	14.096
14	23	21	29.72	2.3113	9	42	43.9	14.146
15	23	23	48.26	2.3067	9	28	33.7	14.194
16	23	26	6.52	2.3021	9	14	20.6	14.242
17	23	28	24.51	2.2976	9	0	4.7	14.287
18	23	30	42.23	2.2930	8	45	46.1	14.331
19	23	32	59.68	2.2886	8	31	25.0	14.372
20	23	35	16.86	2.2842	8	17	1.4	14.412
21	23	37	33.78	2.2798	8	2	35.5	14.450
22	23	39	50.44	2.2756	7	48	7.4	14.487
23	23	42	6.85	2.2713	7	33	37.1	14.522
24	23	44	23.00	2.2672	S. 7	19	4.8	14.551

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	MONDAY 25.					WEDNESDAY 27.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	23 44 23.00	2.2672	S. 7 19 4.8	14.554	0	1 29 41.54	2.1476	N. 4 27 14.5	14.316
1	23 46 38.91	2.2632	7 4 30.6	14.585	1	1 31 50.37	2.1468	4 41 32.3	14.277
2	23 48 54.58	2.2591	6 49 54.6	14.615	2	1 33 59.15	2.1461	4 55 47.7	14.237
3	23 51 10.00	2.2551	6 35 16.8	14.643	3	1 36 7.90	2.1454	5 10 0.7	14.196
4	23 53 25.19	2.2512	6 20 37.4	14.669	4	1 38 16.60	2.1448	5 24 11.2	14.153
5	23 55 40.15	2.2474	6 5 56.5	14.693	5	1 40 25.28	2.1443	5 38 19.1	14.110
6	23 57 54.88	2.2436	5 51 14.2	14.716	6	1 42 33.92	2.1438	5 52 24.4	14.066
7	0 0 9.38	2.2398	5 36 30.6	14.737	7	1 44 42.54	2.1435	6 6 27.0	14.020
8	0 2 23.66	2.2362	5 21 45.7	14.757	8	1 46 51.14	2.1432	6 20 26.8	13.973
9	0 4 37.72	2.2326	5 6 59.7	14.775	9	1 48 59.72	2.1428	6 34 23.8	13.925
10	0 6 51.57	2.2291	4 52 12.7	14.791	10	1 51 8.28	2.1427	6 48 17.8	13.876
11	0 9 5.21	2.2257	4 37 24.8	14.806	11	1 53 16.84	2.1426	7 2 8.9	13.826
12	0 11 18.65	2.2223	4 22 36.0	14.819	12	1 55 25.39	2.1425	7 15 56.9	13.774
13	0 13 31.89	2.2190	4 7 46.5	14.830	13	1 57 33.94	2.1425	7 29 41.8	13.722
14	0 15 44.93	2.2157	3 52 56.4	14.840	14	1 59 42.49	2.1426	7 43 23.5	13.667
15	0 17 57.78	2.2126	3 38 5.7	14.848	15	2 1 51.05	2.1427	7 57 1.9	13.613
16	0 20 10.44	2.2094	3 23 14.6	14.855	16	2 3 59.62	2.1429	8 10 37.1	13.558
17	0 22 22.91	2.2064	3 8 23.1	14.861	17	2 6 8.20	2.1431	8 24 8.9	13.501
18	0 24 35.21	2.2035	2 53 31.3	14.865	18	2 8 16.79	2.1433	8 37 37.2	13.442
19	0 26 47.33	2.2006	2 38 39.3	14.867	19	2 10 25.40	2.1437	8 51 2.0	13.383
20	0 28 59.28	2.1977	2 23 47.3	14.867	20	2 12 34.04	2.1442	9 4 23.2	13.323
21	0 31 11.06	2.1950	2 8 55.3	14.866	21	2 14 42.71	2.1447	9 17 40.8	13.262
22	0 33 22.68	2.1923	1 54 3.4	14.863	22	2 16 51.40	2.1451	9 30 54.7	13.201
23	0 35 34.14	2.1897	S. 1 39 11.7	14.860	23	2 19 0.12	2.1457	N. 9 44 4.9	13.137
	TUESDAY 26.					THURSDAY 28.			
0	0 37 45.44	2.1872	S. 1 24 20.2	14.855	0	2 21 8.88	2.1463	N. 9 57 11.2	13.072
1	0 39 56.60	2.1847	1 9 29.1	14.848	1	2 23 17.68	2.1470	10 10 13.6	13.007
2	0 42 7.61	2.1822	0 54 38.4	14.840	2	2 25 26.52	2.1477	10 23 12.1	12.942
3	0 44 18.47	2.1799	0 39 48.3	14.830	3	2 27 35.41	2.1486	10 36 6.6	12.874
4	0 46 29.20	2.1777	0 24 58.8	14.819	4	2 29 44.35	2.1494	10 48 57.0	12.806
5	0 48 39.80	2.1756	S. 0 10 10.0	14.807	5	2 31 53.34	2.1502	11 1 43.3	12.737
6	0 50 50.27	2.1734	N. 0 4 38.0	14.792	6	2 34 2.38	2.1512	11 14 25.4	12.666
7	0 53 0.61	2.1713	0 19 25.1	14.777	7	2 36 11.48	2.1522	11 27 3.2	12.594
8	0 55 10.83	2.1694	0 34 11.3	14.762	8	2 38 20.64	2.1532	11 39 36.7	12.522
9	0 57 20.94	2.1676	0 48 56.5	14.743	9	2 40 29.87	2.1543	11 52 5.9	12.449
10	0 59 30.94	2.1657	1 3 40.5	14.723	10	2 42 39.16	2.1553	12 4 30.6	12.374
11	1 1 40.83	2.1639	1 18 23.3	14.702	11	2 44 48.51	2.1565	12 16 50.8	12.299
12	1 3 50.61	2.1622	1 33 4.8	14.681	12	2 46 57.94	2.1577	12 29 6.5	12.223
13	1 6 0.30	2.1607	1 47 45.0	14.657	13	2 49 7.44	2.1590	12 41 17.6	12.147
14	1 8 9.89	2.1591	2 2 23.7	14.632	14	2 51 17.02	2.1603	12 53 24.1	12.068
15	1 10 19.39	2.1577	2 17 0.9	14.607	15	2 53 26.68	2.1616	13 5 25.8	11.989
16	1 12 28.81	2.1562	2 31 36.5	14.579	16	2 55 36.41	2.1629	13 17 22.8	11.909
17	1 14 38.14	2.1549	2 46 10.4	14.551	17	2 57 46.23	2.1643	13 29 14.9	11.828
18	1 16 47.40	2.1537	3 0 42.6	14.521	18	2 59 56.13	2.1658	13 41 2.2	11.747
19	1 18 56.58	2.1524	3 15 12.9	14.489	19	3 2 6.13	2.1673	13 52 44.5	11.664
20	1 21 5.69	2.1513	3 29 41.3	14.457	20	3 4 16.21	2.1687	14 4 21.9	11.581
21	1 23 14.74	2.1503	3 44 7.8	14.424	21	3 6 26.38	2.1703	14 15 54.2	11.496
22	1 25 23.73	2.1493	3 58 32.2	14.388	22	3 8 36.65	2.1719	14 27 21.4	11.410
23	1 27 32.66	2.1484	4 12 54.4	14.352	23	3 10 47.01	2.1735	14 38 43.4	11.323
24	1 29 41.54	2.1476	N. 4 27 14.5	14.316	24	3 12 57.47	2.1752	N. 14 50 0.2	11.237

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

FRIDAY 29.

Hour.	Right Ascension. h	m	s	Diff. for 1 Minute. s	Declination. °	′	″	Diff. for 1 Minute. ″
0	3	12	57.47	2.1752	N.14	50	0.2	11.237
1	3	15	8.03	2.1768	15	1	11.8	11.149
2	3	17	18.69	2.1785	15	12	18.1	11.060
3	3	19	29.45	2.1802	15	23	19.0	10.970
4	3	21	40.31	2.1820	15	34	14.5	10.879
5	3	23	51.29	2.1838	15	45	4.5	10.787
6	3	26	2.37	2.1855	15	55	49.0	10.696
7	3	28	13.55	2.1873	16	6	28.0	10.602
8	3	30	24.85	2.1892	16	17	1.3	10.508
9	3	32	36.26	2.1911	16	27	29.0	10.413
10	3	34	47.78	2.1930	16	37	50.9	10.317
11	3	36	59.42	2.1949	16	48	7.1	10.222
12	3	39	11.17	2.1967	16	58	17.5	10.124
13	3	41	23.03	2.1987	17	8	22.0	10.026
14	3	43	35.01	2.2007	17	18	20.6	9.927
15	3	45	47.11	2.2026	17	28	13.3	9.828
16	3	47	59.32	2.2045	17	38	0.0	9.727
17	3	50	11.65	2.2065	17	47	40.6	9.626
18	3	52	24.10	2.2085	17	57	15.1	9.524
19	3	54	36.67	2.2105	18	6	43.5	9.422
20	3	56	49.36	2.2124	18	16	5.7	9.317
21	3	59	2.16	2.2144	18	25	21.6	9.213
22	4	1	15.09	2.2164	18	34	31.3	9.109
23	4	3	28.13	2.2184	N.18	43	34.7	9.003

SATURDAY 30.

Hour.	Right Ascension. h	m	s	Diff. for 1 Minute. s	Declination. °	′	″	Diff. for 1 Minute. ″
0	4	5	41.30	2.2204	N.18	52	31.7	8.897
1	4	7	54.58	2.2224	19	1	22.3	8.790
2	4	10	7.99	2.2244	19	10	6.5	8.682
3	4	12	21.51	2.2263	19	18	44.1	8.573
4	4	14	35.15	2.2282	19	27	15.3	8.465
5	4	16	48.90	2.2302	19	35	39.9	8.354
6	4	19	2.78	2.2322	19	43	57.8	8.243
7	4	21	16.77	2.2341	19	52	9.1	8.133
8	4	23	30.87	2.2360	20	0	13.8	8.022
9	4	25	45.09	2.2379	20	8	11.7	7.909
10	4	27	59.42	2.2398	20	16	2.9	7.796
11	4	30	13.87	2.2417	20	23	47.2	7.682
12	4	32	28.43	2.2436	20	31	24.7	7.567
13	4	34	43.10	2.2454	20	38	55.3	7.453
14	4	36	57.88	2.2472	20	46	19.1	7.338
15	4	39	12.77	2.2491	20	53	35.9	7.222
16	4	41	27.77	2.2508	21	0	45.7	7.105
17	4	43	42.87	2.2526	21	7	48.5	6.987
18	4	45	58.08	2.2543	21	14	44.2	6.870
19	4	48	13.39	2.2560	21	21	32.9	6.752
20	4	50	28.80	2.2577	21	28	14.5	6.633
21	4	52	44.31	2.2592	21	34	48.9	6.514
22	4	54	59.91	2.2608	21	41	16.2	6.394
23	4	57	15.61	2.2625	21	47	36.2	6.273
24	4	59	31.41	2.2641	N.21	53	49.0	6.153

SUNDAY 31.

Hour.	Right Ascension. h	m	s	Diff. for 1 Minute. s	Declination. °	′	″	Diff. for 1 Minute. ″
0	4	59	31.41	2.2641	N.21	53	49.0	6.153
1	5	1	47.30	2.2655	21	59	54.6	6.032
2	5	4	3.27	2.2669	22	5	52.8	5.909
3	5	6	19.33	2.2683	22	11	43.7	5.787
4	5	8	35.47	2.2698	22	17	27.3	5.665
5	5	10	51.70	2.2712	22	23	3.5	5.542
6	5	13	8.01	2.2724	22	28	32.3	5.418
7	5	15	24.39	2.2736	22	33	53.7	5.295
8	5	17	40.84	2.2748	22	39	7.7	5.171
9	5	19	57.37	2.2761	22	44	14.2	5.046
10	5	22	13.97	2.2772	22	49	13.2	4.921
11	5	24	30.63	2.2782	22	54	4.7	4.795
12	5	26	47.35	2.2792	22	58	48.6	4.669
13	5	29	4.13	2.2802	23	3	25.0	4.544
14	5	31	20.97	2.2812	23	7	53.9	4.418
15	5	33	37.87	2.2820	23	12	15.2	4.292
16	5	35	54.81	2.2827	23	16	28.9	4.164
17	5	38	11.80	2.2835	23	20	34.9	4.037
18	5	40	28.83	2.2842	23	24	33.3	3.910
19	5	42	45.90	2.2848	23	28	24.1	3.782
20	5	45	3.01	2.2854	23	32	7.2	3.655
21	5	47	20.15	2.2859	23	35	42.7	3.527
22	5	49	37.32	2.2863	23	39	10.4	3.398
23	5	51	54.51	2.2867	N.23	42	30.5	3.270

MONDAY, FEBRUARY 1.

Hour.	Right Ascension. h	m	s	Diff. for 1 Minute. s	Declination. °	′	″	Diff. for 1 Minute. ″
0	5	54	11.73	2.2872	N.23	45	42.8	3.141

PHASES OF THE MOON.

			d	h	m
○	Full Moon	Jan.	6	2	12.7
☾	Last Quarter		14	6	11.3
●	New Moon		21	12	11.8
☽	First Quarter		28	3	7.4

			d	h
☾	Apogee	Jan.	11	2.9
☾	Perigee		23	1.2

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh	P. L. of Diff.	VIh	P. L. of Diff.	IXh	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
1	α Pegasi	W.	51 54 3	3186	53 20 29	3165	54 47 20	3146	56 14 34	3129
	SATURN	W.	35 26 20	2516	37 7 11	2523	38 47 53	2530	40 28 25	2537
	Pollux	E.	73 9 45	2500	71 28 32	2508	69 47 30	2517	68 6 40	2525
	Regulus	E.	109 7 30	2500	107 26 17	2507	105 45 13	2515	104 4 20	2522
	JUPITER	E.	125 5 22	2500	123 24 9	2507	121 43 5	2514	120 2 11	2522
2	α Pegasi	W.	63 35 0	3074	65 3 41	3068	66 32 30	3063	68 1 25	3060
	SATURN	W.	48 48 31	2574	50 28 1	2582	52 7 21	2590	53 46 30	2598
	Pollux	E.	59 45 22	2567	58 5 42	2576	56 26 14	2585	54 46 58	2593
	Regulus	E.	95 42 39	2562	94 2 52	2570	92 23 16	2578	90 43 51	2585
	JUPITER	E.	111 40 18	2559	110 0 27	2566	108 20 46	2574	106 41 15	2582
3	α Pegasi	W.	75 26 35	3058	76 55 36	3061	78 24 34	3064	79 53 28	3068
	SATURN	W.	61 59 34	2638	63 37 38	2646	65 15 31	2654	66 53 13	2662
	α Arietis	W.	31 49 27	3099	33 17 38	3069	34 46 25	3043	36 15 45	3020
	Pollux	E.	46 33 39	2639	44 55 37	2648	43 17 47	2658	41 40 11	2669
	Regulus	E.	82 29 29	2626	80 51 10	2635	79 13 3	2643	77 35 7	2652
	JUPITER	E.	98 26 21	2621	96 47 55	2629	95 9 39	2637	93 31 35	2645
4	α Pegasi	W.	87 16 33	3097	88 44 46	3105	90 12 50	3114	91 40 43	3123
	SATURN	W.	74 58 57	2704	76 35 32	2712	78 11 56	2721	79 48 8	2729
	α Arietis	W.	43 48 6	2954	45 19 17	2948	46 50 35	2943	48 21 59	2939
	Pollux	E.	33 35 46	2725	31 59 38	2737	30 23 47	2750	28 48 14	2764
	Regulus	E.	69 28 17	2695	67 51 30	2704	66 14 55	2713	64 38 32	2722
	JUPITER	E.	85 23 56	2687	83 46 58	2695	82 10 11	2703	80 33 35	2711
	Spica	E.	123 24 47	2724	121 48 39	2731	120 12 40	2738	118 36 51	2745
5	α Pegasi	W.	98 57 6	3179	100 23 40	3192	101 49 59	3205	103 16 2	3220
	SATURN	W.	87 46 17	2773	89 21 20	2782	90 56 11	2791	92 30 50	2800
	α Arietis	W.	55 59 38	2939	57 31 8	2941	59 2 35	2943	60 33 59	2946
	Aldebaran	W.	24 6 55	2806	25 41 15	2810	27 15 30	2814	28 49 40	2818
	Regulus	E.	56 39 34	2767	55 4 23	2777	53 29 25	2786	51 54 39	2796
	JUPITER	E.	72 33 27	2755	70 58 0	2764	69 22 45	2773	67 47 41	2782
	Spica	E.	110 40 13	2785	109 5 25	2793	107 30 47	2801	105 56 20	2809
6	SATURN	W.	100 21 13	2845	101 54 42	2854	103 28 0	2863	105 1 6	2872
	α Arietis	W.	68 9 42	2971	69 40 31	2977	71 11 13	2983	72 41 48	2989
	Aldebaran	W.	36 38 50	2848	38 12 15	2855	39 45 32	2862	41 18 39	2869
	Regulus	E.	44 4 1	2846	42 30 33	2856	40 57 18	2867	39 24 17	2877
	JUPITER	E.	59 55 19	2827	58 21 26	2836	56 47 45	2845	55 14 16	2855
	Spica	E.	98 6 48	2852	96 33 27	2861	95 0 18	2869	93 27 20	2878
7	SATURN	W.	112 43 44	2917	114 15 41	2926	115 47 27	2935	117 19 2	2943
	α Arietis	W.	80 12 36	3024	81 42 19	3032	83 11 52	3039	84 41 16	3047
	Aldebaran	W.	49 1 49	2909	50 33 57	2916	52 5 56	2924	53 37 44	2932
	Regulus	E.	31 42 42	2935	30 11 8	2949	28 39 51	2963	27 8 51	2977
	JUPITER	E.	47 29 51	2901	45 57 34	2910	44 25 28	2920	42 53 34	2930
	Spica	E.	85 45 14	2921	84 13 22	2930	82 41 42	2939	81 10 13	2947
8	α Arietis	W.	92 5 49	3087	93 34 15	3095	95 2 31	3103	96 30 37	3111
	Aldebaran	W.	61 14 19	2970	62 45 9	2977	64 15 50	2985	65 46 22	2992
	JUPITER	E.	35 17 11	2979	33 46 31	2989	32 16 4	2999	30 45 50	3010

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XV^{h}	P. L. of Diff.	XVIII^{h}	P. L. of Diff.	XXI^{h}	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
1	*a* Pegasi	W.	57 42 8	3114	59 10 0	3102	60 38 7	3091	62 6 28	3082
	SATURN	W.	42 8 47	2544	43 48 59	2552	45 29 0	2559	47 8 50	2566
	Pollux	E.	66 26 1	2533	64 45 34	2541	63 5 18	2550	61 25 14	2559
	Regulus	E.	102 23 38	2530	100 43 7	2538	99 2 47	2546	97 22 38	2553
	JUPITER	E.	118 21 28	2529	116 40 55	2536	115 0 32	2543	113 20 20	2551
2	*a* Pegasi	W.	69 30 24	3058	70 59 25	3057	72 28 28	3056	73 57 32	3056
	SATURN	W.	55 25 29	2606	57 4 16	2613	58 42 53	2621	60 21 19	2629
	Pollux	E.	53 7 53	2602	51 29 1	2611	49 50 21	2620	48 11 54	2629
	Regulus	E.	89 4 36	2593	87 25 32	2602	85 46 40	2610	84 7 59	2618
	JUPITER	E.	105 1 55	2590	103 22 45	2598	101 43 47	2605	100 4 59	2613
3	*a* Pegasi	W.	81 22 18	3072	82 51 2	3077	84 19 40	3083	85 48 11	3090
	SATURN	W.	68 30 44	2670	70 8 4	2678	71 45 13	2687	73 22 10	2695
	a Arietis	W.	37 45 34	3000	39 15 47	2985	40 46 18	2973	42 17 5	2962
	Pollux	E.	40 2 49	2679	38 25 41	2690	36 48 48	2701	35 12 9	2713
	Regulus	E.	75 57 22	2660	74 19 49	2669	72 42 27	2677	71 5 16	2686
	JUPITER	E.	91 53 41	2653	90 15 58	2661	88 38 27	2669	87 1 6	2678
4	*a* Pegasi	W.	93 8 25	3133	94 35 56	3143	96 3 13	3154	97 30 17	3166
	SATURN	W.	81 24 9	2738	82 59 58	2747	84 35 36	2756	86 11 2	2764
	a Arietis	W.	49 53 28	2938	51 24 59	2937	52 56 32	2936	54 28 5	2937
	Pollux	E.	27 12 59	2780	25 38 5	2797	24 3 33	2815	22 29 24	2833
	Regulus	E.	63 2 20	2731	61 26 21	2739	59 50 33	2748	58 14 57	2758
	JUPITER	E.	78 57 10	2720	77 20 57	2729	75 44 56	2738	74 9 6	2746
	Spica	E.	117 1 11	2753	115 25 41	2761	113 50 22	2768	112 15 12	2776
5	*a* Pegasi	W.	104 41 47	3236	106 7 14	3252	107 32 22	3269	108 57 10	3285
	SATURN	W.	94 5 18	2809	95 39 34	2818	97 13 39	2827	98 47 32	2836
	a Arietis	W.	62 5 19	2950	63 36 33	2955	65 7 42	2960	66 38 45	2965
	Aldebaran	W.	30 23 45	2823	31 57 43	2829	33 31 33	2835	35 5 16	2842
	Regulus	E.	50 20 6	2806	48 45 45	2816	47 11 38	2825	45 37 43	2835
	JUPITER	E.	66 12 49	2791	64 38 9	2800	63 3 41	2809	61 29 24	2818
	Spica	E.	104 22 4	2818	102 47 59	2826	101 14 4	2834	99 40 20	2843
6	SATURN	W.	106 34 1	2881	108 6 44	2890	109 39 15	2899	111 11 35	2908
	a Arietis	W.	74 12 15	2996	75 42 33	3002	77 12 43	3009	78 42 44	3017
	Aldebaran	W.	42 51 37	2878	44 24 24	2885	45 57 2	2893	47 29 30	2901
	Regulus	E.	37 51 29	2888	36 18 55	2900	34 46 36	2912	33 14 32	2923
	JUPITER	E.	53 40 59	2864	52 7 54	2873	50 35 1	2883	49 2 20	2892
	Spica	E.	91 54 33	2887	90 21 57	2895	88 49 32	2903	87 17 17	2912
7	SATURN	W.	118 50 26	2952	120 21 39	2960	121 52 42	2969	123 23 34	2977
	a Arietis	W.	86 10 30	3055	87 39 34	3063	89 8 29	3071	90 37 14	3079
	Aldebaran	W.	55 9 23	2940	56 40 51	2947	58 12 10	2955	59 43 19	2962
	Regulus	E.	25 38 8	2993	24 7 46	3009	22 37 44	3027	21 8 4	3047
	JUPITER	E.	41 21 53	2940	39 50 24	2949	38 19 8	2959	36 48 3	2969
	Spica	E.	79 38 54	2956	78 7 46	2965	76 36 49	2973	75 6 3	2981
8	*a* Arietis	W.	97 58 33	3120	99 26 18	3128	100 53 54	3136	102 21 20	3144
	Aldebaran	W.	67 16 45	2999	68 46 59	3005	70 17 5	3012	71 47 2	3018
	JUPITER	E.	29 15 49	3021	27 46 2	3032	26 16 29	3044	24 47 11	3057

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	III^{h}	P. L. of Diff.	VI^{h}	P. L. of Diff.	IX^{h}	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
8	Spica	E.	73 35 27	2990	72 5 2	2998	70 34 47	3006	69 4 42	3015
	Antares	E.	119 29 30	2989	117 59 4	2996	116 28 46	3003	114 58 37	3010
9	*a* Arietis	W.	103 48 36	3153	105 15 42	3161	106 42 39	3169	108 9 25	3178
	Aldebaran	W.	73 16 52	3025	74 46 34	3031	76 16 8	3037	77 45 35	3043
	Pollux	W.	29 13 57	3065	30 42 50	3067	32 11 40	3069	33 40 28	3072
	Spica	E.	61 36 47	3053	60 7 40	3061	58 38 43	3068	57 9 55	3075
	Antares	E.	107 29 52	3041	106 0 30	3047	104 31 15	3053	103 2 8	3058
10	Aldebaran	W.	85 11 12	3066	86 40 2	3070	88 8 48	3074	89 37 29	3077
	Pollux	W.	41 3 36	3085	42 32 4	3087	44 0 29	3089	45 28 52	3091
	Spica	E.	49 47 59	3109	48 20 1	3115	46 52 10	3122	45 24 27	3128
	Antares	E.	95 38 3	3081	94 9 31	3085	92 41 3	3088	91 12 40	3091
	SUN	E.	136 13 31	3450	134 52 11	3454	133 30 55	3458	132 9 44	3461
11	Aldebaran	W.	97 0 2	3089	98 28 25	3090	99 56 46	3091	101 25 7	3091
	Pollux	W.	52 50 13	3098	54 18 25	3099	55 46 36	3098	57 14 48	3098
	Regulus	W.	17 8 32	3204	18 34 37	3189	20 0 59	3176	21 27 37	3165
	Spica	E.	38 7 47	3160	36 40 50	3168	35 14 2	3175	33 47 23	3183
	Antares	E.	83 51 35	3104	82 23 30	3105	80 55 26	3105	79 27 23	3106
	SUN	E.	125 24 38	3473	124 3 44	3474	122 42 51	3475	121 21 59	3475
12	Aldebaran	W.	108 46 52	3087	110 15 18	3085	111 43 46	3082	113 12 17	3080
	Pollux	W.	64 36 0	3091	66 4 20	3088	67 32 44	3085	69 1 12	3082
	Regulus	W.	28 43 41	3124	30 11 21	3118	31 39 9	3111	33 7 5	3105
	Antares	E.	72 7 11	3103	70 39 5	3101	69 10 57	3099	67 42 46	3096
	SUN	E.	114 37 33	3470	113 16 35	3468	111 55 35	3464	110 34 31	3461
13	Pollux	W.	76 24 45	3058	77 53 46	3052	79 22 55	3045	80 52 13	3038
	Regulus	W.	40 28 40	3072	41 57 24	3064	43 26 18	3056	44 55 22	3047
	JUPITER	W.	24 52 50	3082	26 21 21	3071	27 50 7	3060	29 19 6	3049
	Antares	E.	60 20 55	3078	58 52 18	3073	57 23 35	3067	55 54 45	3061
	SUN	E.	103 48 0	3435	102 26 24	3429	101 4 40	3422	99 42 48	3414
14	Pollux	W.	88 21 4	2995	89 51 23	2985	91 21 53	2975	92 52 37	2964
	Regulus	W.	52 23 21	3001	53 53 33	2991	55 23 57	2980	56 54 35	2968
	JUPITER	W.	36 47 26	2993	38 17 48	2981	39 48 25	2969	41 19 17	2957
	Antares	E.	48 28 42	3027	46 59 3	3020	45 29 15	3012	43 59 17	3005
	SUN	E.	92 51 8	3369	91 28 16	3358	90 5 11	3346	88 41 53	3335
15	Pollux	W.	100 29 51	2904	102 2 5	2890	103 34 36	2876	105 7 25	2863
	Regulus	W.	64 31 32	2905	66 3 44	2891	67 36 14	2877	69 9 2	2863
	JUPITER	W.	48 57 35	2891	50 30 6	2876	52 2 56	2862	53 36 4	2847
	SUN	E.	81 41 52	3270	80 17 5	3255	78 52 1	3240	77 26 40	3225
16	Regulus	W.	76 57 44	2786	78 32 30	2770	80 7 37	2753	81 43 6	2737
	JUPITER	W.	61 26 37	2769	63 1 46	2752	64 37 17	2735	66 13 10	2718
	SUN	E.	70 15 11	3143	68 47 53	3126	67 20 15	3108	65 52 15	3090
17	Regulus	W.	89 46 12	2649	91 24 0	2631	93 2 13	2613	94 40 50	2595
	JUPITER	W.	74 18 26	2629	75 56 41	2611	77 35 21	2593	79 14 26	2574
	Spica	W.	36 3 6	2722	37 39 16	2697	39 16 0	2673	40 53 16	2651

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XV^h	P. L. of Diff.	XVIII^h	P. L. of Diff.	XXI^h	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
8	Spica	E.	67 34 48	3023	66 5 4	3030	64 35 29	3038	63 6 3	3046
	Antares	E.	113 28 36	3017	111 58 44	3023	110 28 59	3029	108 59 22	3035
9	α Arietis	W.	109 36 1	3186	111 2 27	3193	112 28 44	3201	113 54 52	3209
	Aldebaran	W.	79 14 55	3048	80 44 8	3053	82 13 15	3058	83 42 16	3062
	Pollux	W.	35 9 12	3075	36 37 53	3078	38 6 30	3080	39 35 5	3082
	Spica	E.	55 41 15	3082	54 12 44	3089	52 44 21	3096	51 16 6	3102
	Antares	E.	101 33 7	3063	100 4 13	3068	98 35 24	3073	97 6 41	3077
10	Aldebaran	W.	91 6 6	3080	92 34 40	3083	94 3 10	3085	95 31 37	3087
	Pollux	W.	46 57 12	3093	48 25 30	3095	49 53 46	3096	51 22 0	3097
	Spica	E.	43 56 52	3134	42 29 24	3141	41 2 4	3147	39 34 52	3153
	Antares	E.	89 44 20	3095	88 16 4	3098	86 47 52	3100	85 19 42	3102
	SUN	E.	130 48 36	3464	129 27 32	3467	128 6 32	3470	126 45 34	3471
11	Aldebaran	W.	102 53 27	3091	104 21 47	3091	105 50 7	3090	107 18 29	3089
	Pollux	W.	58 43 0	3097	60 11 13	3096	61 39 27	3095	63 7 42	3093
	Regulus	W.	22 54 28	3155	24 21 32	3146	25 48 46	3138	27 16 9	3131
	Spica	E.	32 20 53	3192	30 54 34	3201	29 28 26	3211	28 2 30	3222
	Antares	E.	77 59 21	3107	76 31 20	3106	75 3 18	3105	73 35 15	3104
	SUN	E.	120 1 7	3475	118 40 15	3474	117 19 23	3473	115 58 29	3471
12	Aldebaran	W.	114 40 51	3077	116 9 30	3073	117 38 12	3069	119 7 0	3065
	Pollux	W.	70 29 44	3078	71 58 21	3073	73 27 3	3069	74 55 51	3064
	Regulus	W.	34 35 8	3099	36 3 19	3092	37 31 38	3086	39 0 5	3079
	Antares	E.	66 14 32	3093	64 46 15	3090	63 17 53	3086	61 49 27	3082
	SUN	E.	109 13 23	3457	107 52 11	3452	106 30 53	3447	105 9 30	3441
13	Pollux	W.	82 21 39	3030	83 51 15	3022	85 21 0	3013	86 50 56	3004
	Regulus	W.	46 24 36	3039	47 54 0	3030	49 23 35	3021	50 53 22	3011
	JUPITER	W.	30 48 19	3038	32 17 45	3027	33 47 25	3016	35 17 18	3004
	Antares	E.	54 25 48	3055	52 56 44	3049	51 27 32	3042	49 58 11	3035
	SUN	E.	98 20 48	3406	96 58 38	3397	95 36 19	3388	94 13 49	3379
14	Pollux	W.	94 23 34	2953	95 54 46	2941	97 26 12	2929	98 57 54	2917
	Regulus	W.	58 25 28	2956	59 56 35	2944	61 27 58	2931	62 59 37	2918
	JUPITER	W.	42 50 24	2944	44 21 47	2931	45 53 26	2918	47 25 22	2905
	Antares	E.	42 29 10	2997	40 58 53	2988	39 28 25	2980	37 57 47	2971
	SUN	E.	87 18 22	3323	85 54 37	3310	84 30 37	3297	83 6 22	3284
15	Pollux	W.	106 40 31	2849	108 13 55	2835	109 47 37	2821	111 21 38	2807
	Regulus	W.	70 42 8	2849	72 15 32	2834	73 49 16	2818	75 23 20	2802
	JUPITER	W.	55 9 31	2832	56 43 17	2817	58 17 23	2801	59 51 50	2785
	SUN	E.	76 1 0	3209	74 35 2	3193	73 8 45	3177	71 42 8	3160
16	Regulus	W.	83 18 57	2719	84 55 11	2702	86 31 48	2685	88 8 48	2667
	JUPITER	W.	67 49 26	2701	69 26 5	2683	71 3 8	2665	72 40 35	2647
	SUN	E.	64 23 53	3072	62 55 9	3053	61 26 2	3034	59 56 32	3016
17	Regulus	W.	96 19 52	2577	97 59 19	2559	99 39 11	2540	101 19 28	2522
	JUPITER	W.	80 53 56	2556	82 33 51	2537	84 14 13	2519	85 55 0	2500
	Spica	W.	42 31 2	2629	44 9 18	2607	45 48 4	2585	47 27 20	2564

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh	P. L. of Diff.	VIh	P. L. of Diff.	IXh	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
17	SUN	E.	58 26 39	2997	56 56 22	2977	55 25 41	2958	53 54 36	2939
18	Regulus	W.	103 0 11	2504	104 41 19	2485	106 22 53	2467	108 4 52	2450
	JUPITER	W.	87 36 13	2482	89 17 51	2463	90 59 56	2445	92 42 26	2427
	Spica	W.	49 7 5	2543	50 47 20	2522	52 28 3	2501	54 9 15	2481
	SUN	E.	46 13 1	2842	44 39 28	2823	43 5 30	2804	41 31 7	2785
19	JUPITER	W.	101 21 24	2339	103 6 28	2322	104 51 56	2305	106 37 49	2288
	Spica	W.	62 42 11	2385	64 26 7	2367	66 10 29	2349	67 55 17	2332
	SUN	E.	33 33 10	2697	31 56 25	2681	30 19 19	2665	28 41 51	2649
23	SUN	W.	21 12 42	2394	22 56 25	2390	24 40 14	2388	26 24 6	2387
	Aldebaran	E.	104 19 19	2058	102 27 15	2059	100 35 12	2060	98 43 11	2062
24	SUN	W.	35 3 20	2397	36 46 59	2403	38 30 29	2409	40 13 51	2416
	Aldebaran	E.	89 24 17	2083	87 32 52	2089	85 41 36	2096	83 50 30	2103
25	SUN	W.	48 48 1	2458	50 30 13	2468	52 12 11	2479	53 53 54	2490
	Aldebaran	E.	74 38 1	2147	72 48 13	2157	70 58 41	2167	69 9 24	2178
	Pollux	E.	118 48 11	2151	116 58 30	2161	115 9 3	2170	113 19 51	2180
26	SUN	W.	62 18 24	2551	63 58 26	2564	65 38 10	2577	67 17 36	2591
	Aldebaran	E.	60 7 17	2238	58 19 46	2251	56 32 35	2264	54 45 43	2278
	Pollux	E.	104 17 52	2237	102 30 20	2249	100 43 5	2262	98 56 9	2274
27	SUN	W.	75 30 3	2662	77 7 34	2676	78 44 46	2690	80 21 39	2705
	a Pegasi	W.	38 11 1	3584	39 29 53	3509	40 50 7	3442	42 11 36	3383
	Aldebaran	E.	45 56 26	2348	44 11 37	2363	42 27 9	2378	40 43 3	2393
	Pollux	E.	90 6 14	2340	88 21 13	2353	86 36 31	2366	84 52 8	2380
28	SUN	W.	88 21 11	2779	89 56 7	2793	91 30 45	2807	93 5 4	2821
	a Pegasi	W.	49 12 55	3195	50 39 10	3172	52 5 53	3152	53 32 59	3136
	Aldebaran	E.	32 8 9	2475	30 26 20	2492	28 44 56	2510	27 3 57	2530
	Pollux	E.	76 15 9	2448	74 32 43	2462	72 50 37	2476	71 8 50	2489
	Regulus	E.	112 14 13	2448	110 31 47	2462	108 49 40	2475	107 7 51	2488
29	SUN	W.	100 52 2	2892	102 24 31	2905	103 56 43	2919	105 28 38	2933
	a Pegasi	W.	60 52 28	3089	62 20 52	3085	63 49 20	3082	65 17 52	3081
	Pollux	E.	62 44 34	2556	61 4 38	2569	59 25 0	2582	57 45 40	2594
	Regulus	E.	98 43 18	2551	97 3 16	2564	95 23 31	2576	93 44 3	2588
30	SUN	W.	113 4 0	2997	114 34 16	3010	116 4 16	3022	117 34 1	3034
	a Pegasi	W.	72 40 30	3088	74 8 54	3092	75 37 12	3096	77 5 26	3101
	SATURN	W.	57 6 5	2672	58 43 23	2683	60 20 25	2694	61 57 13	2705
	Pollux	E.	49 33 19	2657	47 55 42	2670	46 18 22	2683	44 41 19	2695
	Regulus	E.	85 30 51	2647	83 53 0	2658	82 15 24	2669	80 38 3	2681
31	SUN	W.	124 59 3	3094	126 27 20	3105	127 55 24	3116	129 23 14	3127
	a Pegasi	W.	84 24 47	3136	85 52 13	3144	87 19 29	3153	88 46 35	3162
	SATURN	W.	69 57 40	2757	71 33 5	2767	73 8 16	2776	74 43 15	2785
	Pollux	E.	36 40 9	2757	35 4 45	2770	33 29 38	2783	31 54 48	2797
	Regulus	E.	72 34 57	2733	70 59 1	2743	69 23 19	2753	67 47 49	2763

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XV^{h}	P. L. of Diff.	XVIII^{h}	P. L. of Diff.	XXI^{h}	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
17	Sun	E.	52 23 6	2920	50 51 12	2900	49 18 53	2881	47 46 9	2862
18	Regulus	W.	109 47 16	2432	111 30 5	2414	113 13 20	2396	114 57 0	2379
	Jupiter	W.	94 25 23	2409	96 8 45	2391	97 52 33	2373	99 36 46	2356
	Spica	W.	55 50 55	2461	57 33 3	2442	59 15 38	2422	60 58 41	2403
	Sun	E.	39 56 20	2766	38 21 8	2748	36 45 32	2730	35 9 32	2713
19	Jupiter	W.	108 24 6	2272	110 10 46	2257	111 57 49	2242	113 45 15	2227
	Spica	W.	69 40 30	2315	71 26 8	2298	73 12 10	2281	74 58 37	2265
	Sun	E.	27 4 2	2635	25 25 54	2622	23 47 29	2610	22 8 48	2599
23	Sun	W.	28 8 0	2387	29 51 54	2388	31 35 46	2390	33 19 35	2393
	Aldebaran	E.	96 51 14	2065	94 59 21	2068	93 7 33	2072	91 15 51	2077
24	Sun	W.	41 57 3	2423	43 40 5	2431	45 22 56	2439	47 5 35	2448
	Aldebaran	E.	81 59 35	2111	80 8 52	2119	78 18 21	2128	76 28 4	2137
25	Sun	W.	55 35 21	2502	57 16 32	2514	58 57 26	2526	60 38 4	2538
	Aldebaran	E.	67 20 23	2190	65 31 40	2201	63 43 14	2213	61 55 6	2226
	Pollux	E.	111 30 54	2191	109 42 13	2202	107 53 49	2214	106 5 42	2225
26	Sun	W.	68 56 43	2605	70 35 31	2618	72 14 1	2632	73 52 12	2647
	Aldebaran	E.	52 59 11	2292	51 12 59	2306	49 27 8	2320	47 41 37	2334
	Pollux	E.	97 9 32	2287	95 23 14	2300	93 37 15	2313	91 51 35	2326
27	Sun	W.	81 58 12	2720	83 34 26	2735	85 10 20	2749	86 45 55	2763
	a Pegasi	W.	43 34 12	3333	44 57 45	3291	46 22 7	3254	47 47 12	3222
	Aldebaran	E.	38 59 19	2409	37 15 57	2425	35 32 58	2441	33 50 22	2458
	Pollux	E.	83 8 5	2394	81 24 22	2408	79 40 58	2422	77 57 54	2435
28	Sun	W.	94 39 4	2835	96 12 46	2850	97 46 9	2864	99 19 14	2878
	a Pegasi	W.	55 0 25	3123	56 28 7	3111	57 56 3	3101	59 24 11	3094
	Aldebaran	E.	25 23 25	2550	23 43 21	2572	22 3 48	2596	20 24 47	2621
	Pollux	E.	69 27 21	2503	67 46 12	2517	66 5 21	2530	64 24 48	2543
	Regulus	E.	105 26 21	2501	103 45 9	2513	102 4 14	2526	100 23 37	2539
29	Sun	W.	107 0 15	2946	108 31 36	2959	110 2 40	2972	111 33 28	2985
	a Pegasi	W.	66 46 25	3081	68 14 58	3081	69 43 31	3082	71 12 2	3085
	Pollux	E.	56 6 37	2607	54 27 52	2620	52 49 24	2632	51 11 13	2645
	Regulus	E.	92 4 52	2600	90 25 58	2612	88 47 20	2624	87 8 58	2635
30	Sun	W.	119 3 31	3047	120 32 46	3059	122 1 46	3070	123 30 32	3082
	a Pegasi	W.	78 33 34	3108	80 1 34	3114	81 29 27	3121	82 57 11	3128
	Saturn	W.	63 33 47	2716	65 10 6	2726	66 46 11	2737	68 22 2	2747
	Pollux	E.	43 4 32	2707	41 28 1	2719	39 51 47	2732	38 15 50	2744
	Regulus	E.	79 0 57	2692	77 24 6	2702	75 47 29	2713	74 11 6	2723
31	Sun	W.	130 50 51	3138	132 18 14	3149	133 45 24	3160	135 12 21	3171
	a Pegasi	W.	90 13 30	3171	91 40 14	3181	93 6 46	3191	94 33 6	3201
	Saturn	W.	76 18 2	2795	77 52 36	2805	79 26 58	2814	81 1 8	2822
	Pollux	E.	30 20 16	2811	28 46 2	2826	27 12 8	2842	25 38 34	2857
	Regulus	E.	66 12 33	2773	64 37 30	2783	63 2 40	2792	61 28 2	2801

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Semi-diameter	Sidereal Time of Semi-diameter Passing Meridian.	Equation of Time, to be Added to Apparent Time.	Diff. for 1 Hour.
		h m s	s	° ′ ″	″	′ ″	s	m s	s
Mon.	1	20 57 58.54	10.198	S. 17 11 39.9	+42.45	16 15.65	68.28	13 44.16	0.341
Tues.	2	21 2 2.87	10.163	16 54 32.1	43.19	16 15.51	68.16	13 51.92	0.306
Wed.	3	21 6 6.38	10.129	16 37 6.7	43.92	16 15.36	68.05	13 58.85	0.272
Thur.	4	21 10 9.06	10.095	16 19 24.0	+44.63	16 15.20	67.93	14 4.96	0.238
Frid.	5	21 14 10.92	10.061	16 1 24.4	45.33	16 15.04	67.82	14 10.25	0.204
Sat.	6	21 18 11.97	10.027	15 43 8.3	46.00	16 14.88	67.70	14 14.73	0.170
SUN.	7	21 22 12.21	9.993	15 24 36.2	+46.67	16 14.71	67.59	14 18.41	0.136
Mon.	8	21 26 11.65	9.960	15 5 48.3	47.31	16 14.53	67.47	14 21.29	0.104
Tues.	9	21 30 10.31	9.928	14 46 45.1	47.94	16 14.34	67.36	14 23.39	0.072
Wed.	10	21 34 8.19	9.896	14 27 27.1	+48.55	16 14.16	67.25	14 24.71	0.040
Thur.	11	21 38 5.31	9.864	14 7 54.7	49.14	16 13.97	67.14	14 25.27	0.008
Frid.	12	21 42 1.67	9.832	13 48 8.3	49.72	16 13.78	67.03	14 25.08	0.024
Sat.	13	21 45 57.28	9.801	13 28 8.0	+50.29	16 13.58	66.92	14 24.14	0.054
SUN.	14	21 49 52.15	9.771	13 7 54.4	50.83	16 13.39	66.82	14 22.46	0.084
Mon.	15	21 53 46.30	9.741	12 47 28.1	51.35	16 13.19	66.72	14 20.06	0.114
Tues.	16	21 57 39.74	9.712	12 26 49.4	+51.86	16 12.98	66.61	14 16.94	0.144
Wed.	17	22 1 32.47	9.683	12 5 58.6	52.36	16 12.77	66.50	14 13.13	0.173
Thur.	18	22 5 24.50	9.654	11 44 56.2	52.84	16 12.56	66.40	14 8.63	0.202
Frid.	19	22 9 15.85	9.625	11 23 42.5	+53.30	16 12.34	66.30	14 3.44	0.230
Sat.	20	22 13 6.52	9.597	11 2 18.1	53.73	16 12.12	66.21	13 57.57	0.258
SUN.	21	22 16 56.52	9.570	10 40 43.5	54.15	16 11.90	66.11	13 51.03	0.285
Mon.	22	22 20 45.87	9.543	10 18 58.9	+54.56	16 11.68	66.02	13 43.84	0.312
Tues.	23	22 24 34.57	9.516	9 57 4.8	54.94	16 11.46	65.93	13 36.01	0.339
Wed.	24	22 28 22.63	9.490	9 35 1.9	55.30	16 11.24	65.84	13 27.54	0.366
Thur.	25	22 32 10.07	9.465	9 12 50.3	+55.65	16 11.02	65.75	13 18.45	0.391
Frid.	26	22 35 56.91	9.440	8 50 30.5	55.99	16 10.79	65.67	13 8.77	0.416
Sat.	27	22 39 43.16	9.415	8 28 3.0	56.31	16 10.56	65.59	12 58.50	0.440
SUN.	28	22 43 28.84	9.391	8 5 28.1	56.60	16 10.33	65.51	12 47.65	0.464
Mon.	29	22 47 13.97	9.368	S. 7 42 46.3	+56.88	16 10.09	65.43	12 36.25	0.486

NOTE.—The mean time of semidiameter passing the meridian may be found by subtracting $0^s.18$ from the sidereal time. The sign + prefixed to the hourly change of declination indicates that south declinations are decreasing.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S Apparent Right Ascension.	THE SUN'S Diff. for 1 Hour.	THE SUN'S Apparent Declination.	THE SUN'S Diff. for 1 Hour.	Equation of Time, to be Subtracted from Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		h m s	s	° ′ ″	″	m s	s	h m s
Mon.	1	20 57 56.21	10.198	S. 17 11 49.6	+42.44	13 44.09	0.341	20 44 12.12
Tues.	2	21 2 0.54	10.163	16 54 42.1	43.18	13 51.86	0.306	20 48 8.67
Wed.	3	21 6 4.03	10.128	16 37 16.9	43.91	13 58.80	0.272	20 52 5.23
Thur.	4	21 10 6.70	10.094	16 19 34.4	+44.62	14 4.91	0.238	20 56 1.78
Frid.	5	21 14 8.55	10.060	16 1 35.1	45.32	14 10.21	0.204	20 59 58.34
Sat.	6	21 18 9.59	10.026	15 43 19.2	46.00	14 14.70	0.170	21 3 54.89
SUN.	7	21 22 9.83	9.993	15 24 47.3	+46.67	14 18.38	0.136	21 7 51.45
Mon.	8	21 26 9.27	9.960	15 5 59.5	47.31	14 21.27	0.104	21 11 48.00
Tues.	9	21 30 7.93	9.928	14 46 56.6	47.94	14 23.37	0.072	21 15 44.56
Wed.	10	21 34 5.82	9.896	14 27 38.8	+48.55	14 24.71	0.040	21 19 41.11
Thur.	11	21 38 2.95	9.864	14 8 6.5	49.14	14 25.28	0.008	21 23 37.67
Frid.	12	21 41 59.32	9.833	13 48 20.2	49.72	14 25.09	0.024	21 27 34.22
Sat.	13	21 45 54.93	9.802	13 28 20.0	+50.28	14 24.15	0.054	21 31 30.78
SUN.	14	21 49 49.81	9.772	13 8 6.6	50.82	14 22.48	0.084	21 35 27.33
Mon.	15	21 53 43.98	9.742	12 47 40.4	51.35	14 20.09	0.114	21 39 23.89
Tues.	16	21 57 37.43	9.712	12 27 1.7	+51.87	14 16.98	0.144	21 43 20.44
Wed.	17	22 1 30.18	9.683	12 6 11.0	52.36	14 13.18	0.173	21 47 17.00
Thur.	18	22 5 22.23	9.654	11 45 8.7	52.84	14 8.68	0.202	21 51 13.55
Frid.	19	22 9 13.59	9.626	11 23 55.0	+53.29	14 3.49	0.230	21 55 10.11
Sat.	20	22 13 4.28	9.598	11 2 30.6	53.73	13 57.62	0.258	21 59 6.66
SUN.	21	22 16 54.31	9.571	10 40 56.0	54.16	13 51.09	0.285	22 3 3.22
Mon.	22	22 20 43.68	9.544	10 19 11.4	+54.56	13 43.91	0.312	22 6 59.77
Tues.	23	22 24 32.41	9.517	9 57 17.3	54.94	13 36.09	0.339	22 10 56.32
Wed.	24	22 28 20.51	9.491	9 35 14.3	55.31	13 27.63	0.366	22 14 52.88
Thur.	25	22 32 7.98	9.465	9 13 2.6	+55.66	13 18.54	0.391	22 18 49.43
Frid.	26	22 35 54.85	9.440	8 50 42.8	55.99	13 8.86	0.416	22 22 45.99
Sat.	27	22 39 41.13	9.416	8 28 15.2	56.31	12 58.59	0.440	22 26 42.54
SUN.	28	22 43 26.84	9.393	8 5 40.2	56.61	12 47.75	0.463	22 30 39.09
Mon.	29	22 47 12.00	9.370	S. 7 42 58.3	+56.89	12 36.34	0.486	22 34 35.65

Note.—The semidiameter for mean noon may be assumed the same as that for apparent noon.
The sign + prefixed to the hourly change of declination indicates that south declinations are decreasing.

Diff. for 1 Hour,
$+9^{s}.8565$.
(Table III.)

AT GREENWICH MEAN NOON.								
		THE SUN'S						
		TRUE LONGITUDE.						
Day of the Month.	Day of the Year.	λ	λ′	Diff. for 1 Hour.	LATITUDE.	Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.
		° ′ ″	′ ″	″	″			h m s
1	32	312 1 31.6	1 43.0	152.16	— 0.16	9.993 6558	+ 26.1	3 15 15.81
2	33	313 2 22.9	2 34.2	152.11	— 0.02	9.993 7198	27.1	3 11 19.90
3	34	314 3 12.9	3 24.0	152.06	+ 0.10	9.993 7861	28.1	3 7 23.99
4	35	315 4 1.6	4 12.6	152.01	+ 0.20	9.993 8548	+ 29.1	3 3 28.08
5	36	316 4 49.2	5 0.0	151.96	0.29	9.993 9259	30.1	2 59 32.17
6	37	317 5 35.5	5 46.2	151.91	0.36	9.993 9994	31.1	2 55 36.26
7	38	318 6 20.7	6 31.2	151.86	+ 0.40	9.994 0752	+ 32.1	2 51 40.35
8	39	319 7 4.6	7 15.0	151.81	0.43	9.994 1534	33.0	2 47 44.44
9	40	320 7 47.4	7 57.7	151.76	0.42	9.994 2337	33.9	2 43 48.53
10	41	321 8 29.1	8 39.3	151.71	+ 0.38	9.994 3161	+ 34.8	2 39 52.62
11	42	322 9 9.6	9 19.6	151.66	0.31	9.994 4006	35.6	2 35 56.71
12	43	323 9 49.0	9 58.9	151.62	0.23	9.994 4870	36.4	2 32 0.80
13	44	324 10 27.2	10 37.0	151.57	+ 0.12	9.994 5751	+ 37.1	2 28 4.90
14	45	325 11 4.3	11 13.9	151.52	0.00	9.994 6649	37.7	2 24 8.99
15	46	326 11 40.1	11 49.6	151.47	— 0.12	9.994 7562	38.3	2 20 13.08
16	47	327 12 14.8	12 24.2	151.42	— 0.25	9.994 8488	+ 38.8	2 16 17.17
17	48	328 12 48.3	12 57.5	151.37	0.38	9.994 9425	39.3	2 12 21.26
18	49	329 13 20.3	13 29.5	151.31	0.48	9.995 0372	39.7	2 8 25.35
19	50	330 13 51.0	14 0.0	151.25	— 0.57	9.995 1328	+ 40.0	2 4 29.44
20	51	331 14 20.1	14 29.0	151.18	0.63	9.995 2292	40.3	2 0 33.54
21	52	332 14 47.6	14 56.4	151.11	0.66	9.995 3262	40.6	1 56 37.63
22	53	333 15 13.4	15 22.0	151.04	— 0.66	9.995 4240	+ 40.9	1 52 41.72
23	54	334 15 37.3	15 45.9	150.96	0.62	9.995 5225	41.2	1 48 45.81
24	55	335 15 59.3	16 7.8	150.88	0.55	9.995 6219	41.6	1 44 49.90
25	56	336 16 19.4	16 27.7	150.80	— 0.46	9.995 7222	+ 42.0	1 40 54.00
26	57	337 16 37.4	16 45.7	150.71	0.35	9.995 8235	42.4	1 36 58.09
27	58	338 16 53.4	17 1.6	150.62	0.21	9.995 9259	42.9	1 33 2.18
28	59	339 17 7.4	17 15.4	150.54	— 0.08	9.996 0296	+ 43.5	1 29 6.27
29	60	340 17 19.3	17 27.2	150.45	+ 0.05	9.996 1346	+ 44.0	1 25 10.36

Note.—The numbers in column λ correspond to the true equinox of the date; in column λ′ to the mean equinox of January $0^{d}.0$.

Diff. for 1 Hour,
— $9^{s}.8296$.
(Table II.)

GREENWICH MEAN TIME.

THE MOON'S

Day of the Month.	SEMIDIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
	′ ″	′ ″	′ ″	″	′ ″	″	h m	m	d
1	15 14.6	15 10.6	55 50.5	− 1.27	55 35.8	− 1.18	9 30.2	2.20	10.5
2	15 6.8	15 3.4	55 22.1	1.10	55 9.4	1.02	10 22.7	2.17	11.5
3	15 0.2	14 57.2	54 57.6	0.94	54 46.8	0.86	11 14.0	2.10	12.5
4	14 54.5	14 52.1	54 36.9	− 0.78	54 28.1	− 0.69	12 3.2	2.00	13.5
5	14 50.0	14 48.2	54 20.3	0.60	54 13.5	0.51	12 49.8	1.89	14.5
6	14 46.7	14 45.5	54 8.0	0.41	54 3.7	0.30	13 34.0	1.80	15.5
7	14 44.7	14 44.3	54 0.7	− 0.18	53 59.2	− 0.05	14 16.2	1.72	16.5
8	14 44.3	14 44.8	53 59.4	+ 0.08	54 1.3	+ 0.23	14 57.0	1.68	17.5
9	14 45.8	14 47.4	54 5.1	0.40	54 10.8	0.57	15 37.3	1.68	18.5
10	14 49.5	14 52.2	54 18.7	+ 0.75	54 28.7	+ 0.93	16 18.1	1.72	19.5
11	14 55.6	14 59.6	54 41.0	1.13	54 55.7	1.32	17 0.3	1.80	20.5
12	15 4.2	15 9.5	55 12.7	1.51	55 32.0	1.70	17 45.0	1.93	21.5
13	15 15.4	15 21.9	55 53.6	+ 1.88	56 17.2	+ 2.05	18 33.1	2.09	22.5
14	15 28.8	15 36.2	56 42.7	2.19	57 9.8	2.31	19 25.4	2.27	23.5
15	15 43.9	15 51.8	57 38.2	2.39	58 7.3	2.44	20 22.0	2.44	24.5
16	15 59.8	16 7.7	58 36.7	+ 2.43	59 5.7	+ 2.38	21 22.1	2.55	25.5
17	16 15.4	16 22.5	59 33.7	2.26	59 59.9	2.08	22 23.9	2.58	26.5
18	16 28.9	16 34.5	60 23.6	1.84	60 44.1	1.54	23 25.2	2.52	27.5
19	16 39.0	16 42.3	61 0.6	+ 1.19	61 12.7	+ 0.81	☌	. . .	28.5
20	16 44.3	16 45.0	61 20.1	+ 0.40	61 22.4	− 0.02	0 24.4	2.41	0.0
21	16 44.2	16 42.1	61 19.5	− 0.44	61 11.8	0.83	1 20.8	2.29	1.0
22	16 38.7	16 34.2	60 59.5	− 1.20	60 43.1	− 1.51	2 14.6	2.20	2.0
23	16 28.8	16 22.6	60 23.2	1.77	60 0.5	1.98	3 6.7	2.14	3.0
24	16 15.9	16 8.8	59 35.8	2.13	59 9.5	2.22	3 57.9	2.13	4.0
25	16 1.4	15 54.0	58 42.5	− 2.25	58 15.4	− 2.25	4 49.1	2.14	5.0
26	15 46.7	15 39.6	57 48.4	2.20	57 22.4	2.13	5 40.9	2.18	6.0
27	15 32.8	15 26.3	56 57.4	2.03	56 33.7	1.90	6 33.5	2.20	7.0
28	15 20.3	15 14.8	56 11.7	− 1.77	55 51.3	− 1.63	7 26.6	2.21	8.0
29	15 9.7	15 5.1	55 32.6	1.48	55 15.8	1.33	8 19.3	2.18	9.0
30	15 1.0	14 57.4	55 0.7	1.18	54 47.4	1.04	9 10.7	2.11	10.0
31	14 54.2	14 51.5	54 35.8	0.90	54 25.8	0.77	10 0.2	2.01	11.0
32	14 49.2	14 47.3	54 17.4	− 0.64	54 10.5	− 0.52	10 47.3	1.91	12.0

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	MONDAY 1.					WEDNESDAY 3.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	5 54 11.73	2.2872	N.23 45 42.8	3.141	0	7 43 6.63	2.2254	N.23 48 55.5	2.926
1	5 56 28.97	2.2874	23 48 47.4	3.012	1	7 45 20.07	2.2226	23 45 56.4	3.044
2	5 58 46.22	2.2876	23 51 44.3	2.884	2	7 47 33.34	2.2197	23 42 50.2	3.162
3	6 1 3.48	2.2877	23 54 33.5	2.755	3	7 49 46.43	2.2167	23 39 36.9	3.280
4	6 3 20.75	2.2878	23 57 14.9	2.626	4	7 51 59.35	2.2137	23 36 16.6	3.396
5	6 5 38.02	2.2878	23 59 48.6	2.497	5	7 54 12.08	2.2107	23 32 49.4	3.512
6	6 7 55.29	2.2878	24 2 14.5	2.367	6	7 56 24.63	2.2076	23 29 15.2	3.627
7	6 10 12.56	2.2877	24 4 32.7	2.238	7	7 58 36.99	2.2044	23 25 34.1	3.742
8	6 12 29.82	2.2876	24 6 43.1	2.108	8	8 0 49.16	2.2012	23 21 46.1	3.857
9	6 14 47.07	2.2873	24 8 45.7	1.979	9	8 3 1.14	2.1981	23 17 51.3	3.971
10	6 17 4.30	2.2870	24 10 40.6	1.850	10	8 5 12.93	2.1948	23 13 49.6	4.084
11	6 19 21.51	2.2867	24 12 27.7	1.721	11	8 7 24.52	2.1914	23 9 41.2	4.195
12	6 21 38.70	2.2862	24 14 7.1	1.592	12	8 9 35.90	2.1880	23 5 26.1	4.307
13	6 23 55.86	2.2857	24 15 38.7	1.462	13	8 11 47.08	2.1847	23 1 4.3	4.418
14	6 26 12.98	2.2851	24 17 2.6	1.333	14	8 13 58.06	2.1812	22 56 35.9	4.528
15	6 28 30.07	2.2845	24 18 18.7	1.204	15	8 16 8.82	2.1777	22 52 0.9	4.638
16	6 30 47.12	2.2837	24 19 27.1	1.075	16	8 18 19.38	2.1742	22 47 19.3	4.747
17	6 33 4.12	2.2830	24 20 27.7	0.946	17	8 20 29.73	2.1707	22 42 31.2	4.856
18	6 35 21.08	2.2822	24 21 20.6	0.817	18	8 22 39.86	2.1670	22 37 36.6	4.963
19	6 37 37.98	2.2812	24 22 5.7	0.688	19	8 24 49.77	2.1633	22 32 35.6	5.070
20	6 39 54.82	2.2802	24 22 43.1	0.560	20	8 26 59.46	2.1597	22 27 28.2	5.176
21	6 42 11.60	2.2792	24 23 12.9	0.432	21	8 29 8.94	2.1561	22 22 14.5	5.282
22	6 44 28.32	2.2781	24 23 34.9	0.302	22	8 31 18.19	2.1523	22 16 54.4	5.387
23	6 46 44.97	2.2768	N.24 23 49.2	0.174	23	8 33 27.22	2.1486	N.22 11 28.1	5.490
	TUESDAY 2.					THURSDAY 4.			
0	6 49 1.54	2.2755	N.24 23 55.8	+0.046	0	8 35 36.02	2.1447	N.22 5 55.6	5.593
1	6 51 18.03	2.2742	24 23 54.7	−0.082	1	8 37 44.59	2.1409	22 0 16.9	5.696
2	6 53 34.44	2.2728	24 23 46.0	0.208	2	8 39 52.93	2.1372	21 54 32.1	5.797
3	6 55 50.77	2.2713	24 23 29.7	0.336	3	8 42 1.05	2.1333	21 48 41.2	5.898
4	6 58 7.00	2.2697	24 23 5.7	0.463	4	8 44 8.93	2.1293	21 42 44.3	5.998
5	7 0 23.14	2.2682	24 22 34.1	0.590	5	8 46 16.57	2.1254	21 36 41.4	6.097
6	7 2 39.18	2.2665	24 21 54.9	0.716	6	8 48 23.98	2.1215	21 30 32.6	6.196
7	7 4 55.12	2.2647	24 21 8.2	0.842	7	8 50 31.15	2.1176	21 24 17.9	6.294
8	7 7 10.95	2.2629	24 20 13.9	0.968	8	8 52 38.09	2.1137	21 17 57.3	6.392
9	7 9 26.67	2.2610	24 19 12.0	1.094	9	8 54 44.79	2.1097	21 11 30.9	6.487
10	7 11 42.27	2.2591	24 18 2.6	1.219	10	8 56 51.25	2.1057	21 4 58.8	6.582
11	7 13 57.76	2.2572	24 16 45.7	1.343	11	8 58 57.47	2.1017	20 58 21.0	6.677
12	7 16 13.13	2.2551	24 15 21.4	1.467	12	9 1 3.45	2.0977	20 51 37.5	6.772
13	7 18 28.37	2.2529	24 13 49.6	1.592	13	9 3 9.19	2.0936	20 44 48.4	6.864
14	7 20 43.48	2.2507	24 12 10.4	1.715	14	9 5 14.68	2.0896	20 37 53.8	6.956
15	7 22 58.46	2.2485	24 10 23.8	1.838	15	9 7 19.94	2.0856	20 30 53.7	7.047
16	7 25 13.30	2.2462	24 8 29.8	1.962	16	9 9 24.95	2.0814	20 23 48.1	7.138
17	7 27 28.00	2.2437	24 6 28.4	2.084	17	9 11 29.71	2.0774	20 16 37.1	7.227
18	7 29 42.55	2.2412	24 4 19.7	2.206	18	9 13 34.24	2.0734	20 9 20.8	7.317
19	7 31 56.95	2.2387	24 2 3.7	2.327	19	9 15 38.52	2.0692	20 1 59.1	7.405
20	7 34 11.20	2.2362	23 59 40.5	2.447	20	9 17 42.55	2.0652	19 54 32.2	7.492
21	7 36 25.30	2.2337	23 57 10.1	2.567	21	9 19 46.34	2.0612	19 47 0.1	7.578
22	7 38 39.24	2.2310	23 54 32.4	2.688	22	9 21 49.89	2.0571	19 39 22.8	7.664
23	7 40 53.02	2.2282	23 51 47.5	2.807	23	9 23 53.19	2.0530	19 31 40.4	7.749
24	7 43 6.63	2.2254	N.23 48 55.5	2.926	24	9 25 56.25	2.0489	N.19 23 52.9	7.833

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	FRIDAY 5.					SUNDAY 7.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	9 25 56.25	2.0489	N.19 23 52.9	7.833	0	10 59 53.07	1.8756	N.11 47 6.2	10.886
1	9 27 59.06	2.0448	19 16 0.4	7.916	1	11 1 45.52	1.8728	11 36 11.7	10.929
2	9 30 1.63	2.0408	19 8 3.0	7.997	2	11 3 37.81	1.8702	11 25 14.7	10.973
3	9 32 3.96	2.0367	19 0 0.7	8.079	3	11 5 29.94	1.8674	11 14 15.0	11.016
4	9 34 6.04	2.0327	18 51 53.5	8.160	4	11 7 21.90	1.8647	11 3 12.8	11.057
5	9 36 7.88	2.0287	18 43 41.5	8.240	5	11 9 13.70	1.8621	10 52 8.2	11.097
6	9 38 9.48	2.0246	18 35 24.7	8.319	6	11 11 5.35	1.8596	10 41 1.1	11.138
7	9 40 10.83	2.0205	18 27 3.2	8.397	7	11 12 56.85	1.8570	10 29 51.6	11.177
8	9 42 11.94	2.0166	18 18 37.1	8.473	8	11 14 48.19	1.8544	10 18 39.8	11.217
9	9 44 12.82	2.0126	18 10 6.4	8.550	9	11 16 39.38	1.8520	10 7 25.6	11.255
10	9 46 13.45	2.0085	18 1 31.1	8.626	10	11 18 30.43	1.8497	9 56 9.2	11.292
11	9 48 13.84	2.0046	17 52 51.3	8.700	11	11 20 21.34	1.8473	9 44 50.6	11.327
12	9 50 14.00	2.0007	17 44 7.1	8.773	12	11 22 12.11	1.8450	9 33 29.9	11.363
13	9 52 13.92	1.9967	17 35 18.5	8.847	13	11 24 2.74	1.8427	9 22 7.0	11.399
14	9 54 13.60	1.9927	17 26 25.5	8.919	14	11 25 53.24	1.8406	9 10 42.0	11.434
15	9 56 13.05	1.9888	17 17 28.2	8.991	15	11 27 43.61	1.8384	8 59 14.9	11.467
16	9 58 12.26	1.9849	17 8 26.6	9.061	16	11 29 33.85	1.8363	8 47 45.9	11.500
17	10 0 11.24	1.9811	16 59 20.9	9.130	17	11 31 23.97	1.8343	8 36 14.9	11.533
18	10 2 9.99	1.9772	16 50 11.0	9.199	18	11 33 13.97	1.8323	8 24 41.9	11.565
19	10 4 8.51	1.9734	16 40 57.0	9.267	19	11 35 3.85	1.8303	8 13 7.1	11.595
20	10 6 6.80	1.9696	16 31 38.9	9.335	20	11 36 53.61	1.8284	8 1 30.5	11.625
21	10 8 4.86	1.9658	16 22 16.8	9.401	21	11 38 43.26	1.8266	7 49 52.1	11.655
22	10 10 2.70	1.9622	16 12 50.8	9.466	22	11 40 32.80	1.8247	7 38 11.9	11.684
23	10 12 0.32	1.9584	N.16 3 20.9	9.531	23	11 42 22.23	1.8230	N. 7 26 30.0	11.712
	SATURDAY 6.					MONDAY 8.			
0	10 13 57.71	1.9547	N.15 53 47.1	9.595	0	11 44 11.56	1.8213	N. 7 14 46.4	11.740
1	10 15 54.88	1.9510	15 44 9.5	9.658	1	11 46 0.79	1.8197	7 3 1.2	11.766
2	10 17 51.83	1.9473	15 34 28.1	9.720	2	11 47 49.93	1.8182	6 51 14.5	11.792
3	10 19 48.56	1.9437	15 24 43.1	9.781	3	11 49 38.98	1.8167	6 39 26.2	11.817
4	10 21 45.07	1.9401	15 14 54.4	9.842	4	11 51 27.93	1.8152	6 27 36.4	11.842
5	10 23 41.37	1.9366	15 5 2.0	9.902	5	11 53 16.80	1.8137	6 15 45.1	11.867
6	10 25 37.46	1.9331	14 55 6.1	9.961	6	11 55 5.58	1.8124	6 3 52.4	11.889
7	10 27 33.34	1.9296	14 45 6.7	10.018	7	11 56 54.29	1.8112	5 51 58.4	11.912
8	10 29 29.01	1.9261	14 35 3.9	10.076	8	11 58 42.92	1.8099	5 40 3.0	11.934
9	10 31 24.47	1.9227	14 24 57.6	10.133	9	12 0 31.48	1.8087	5 28 6.3	11.956
10	10 33 19.73	1.9193	14 14 47.9	10.189	10	12 2 19.97	1.8076	5 16 8.3	11.977
11	10 35 14.79	1.9159	14 4 34.9	10.243	11	12 4 8.39	1.8065	5 4 9.1	11.996
12	10 37 9.64	1.9126	13 54 18.7	10.297	12	12 5 56.75	1.8055	4 52 8.8	12.015
13	10 39 4.30	1.9093	13 43 59.3	10.350	13	12 7 45.05	1.8046	4 40 7.3	12.034
14	10 40 58.76	1.9061	13 33 36.7	10.403	14	12 9 33.30	1.8037	4 28 4.7	12.052
15	10 42 53.03	1.9028	13 23 10.9	10.455	15	12 11 21.49	1.8028	4 16 1.1	12.069
16	10 44 47.10	1.8996	13 12 42.1	10.506	16	12 13 9.63	1.8020	4 3 56.4	12.086
17	10 46 40.98	1.8965	13 2 10.2	10.556	17	12 14 57.73	1.8012	3 51 50.8	12.102
18	10 48 34.68	1.8935	12 51 35.4	10.605	18	12 16 45.78	1.8006	3 39 44.2	12.117
19	10 50 28.20	1.8904	12 40 57.6	10.654	19	12 18 33.80	1.8000	3 27 36.7	12.132
20	10 52 21.53	1.8873	12 30 16.9	10.702	20	12 20 21.78	1.7994	3 15 28.3	12.147
21	10 54 14.68	1.8843	12 19 33.4	10.748	21	12 22 9.73	1.7990	3 3 19.1	12.160
22	10 56 7.65	1.8814	12 8 47.1	10.795	22	12 23 57.66	1.7986	2 51 9.1	12.172
23	10 58 0.45	1.8785	11 57 58.0	10.841	23	12 25 45.56	1.7982	2 38 58.4	12.184
24	10 59 53.07	1.8756	N.11 47 6.2	10.886	24	12 27 33.44	1.7978	N. 2 26 47.0	12.195

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

TUESDAY 9.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	12 27 33.44	1.7978	N. 2 26 47.0	12.195
1	12 29 21.30	1.7976	2 14 35.0	12.206
2	12 31 9.15	1.7974	2 2 22.3	12.217
3	12 32 56.99	1.7973	1 50 9.0	12.227
4	12 34 44.83	1.7972	1 37 55.1	12.235
5	12 36 32.66	1.7972	1 25 40.8	12.243
6	12 38 20.49	1.7972	1 13 26.0	12.251
7	12 40 8.33	1.7973	1 1 10.7	12.258
8	12 41 56.17	1.7975	0 48 55.0	12.264
9	12 43 44.03	1.7978	0 36 39.0	12.270
10	12 45 31.91	1.7981	0 24 22.6	12.275
11	12 47 19.80	1.7984	N. 0 12 6.0	12.278
12	12 49 7.72	1.7989	S. 0 0 10.8	12.282
13	12 50 55.67	1.7993	0 12 27.8	12.285
14	12 52 43.64	1.7998	0 24 45.0	12.288
15	12 54 31.65	1.8005	0 37 2.4	12.290
16	12 56 19.70	1.8012	0 49 19.8	12.290
17	12 58 7.79	1.8019	1 1 37.2	12.291
18	12 59 55.93	1.8027	1 13 54.7	12.292
19	13 1 44.12	1.8036	1 26 12.2	12.290
20	13 3 32.36	1.8045	1 38 29.5	12.288
21	13 5 20.66	1.8055	1 50 46.8	12.287
22	13 7 9.02	1.8065	2 3 3.9	12.284
23	13 8 57.44	1.8077	S. 2 15 20.9	12.281

WEDNESDAY 10.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	13 10 45.94	1.8089	S. 2 27 37.6	12.277
1	13 12 34.51	1.8101	2 39 54.1	12.272
2	13 14 23.15	1.8114	2 52 10.2	12.266
3	13 16 11.88	1.8129	3 4 26.0	12.260
4	13 18 0.70	1.8143	3 16 41.4	12.253
5	13 19 49.60	1.8157	3 28 56.4	12.246
6	13 21 38.59	1.8173	3 41 10.9	12.238
7	13 23 27.68	1.8190	3 53 25.0	12.230
8	13 25 16.87	1.8207	4 5 38.5	12.219
9	13 27 6.17	1.8226	4 17 51.3	12.209
10	13 28 55.58	1.8244	4 30 3.6	12.199
11	13 30 45.10	1.8262	4 42 15.2	12.187
12	13 32 34.73	1.8282	4 54 26.1	12.175
13	13 34 24.49	1.8303	5 6 36.2	12.162
14	13 36 14.37	1.8324	5 18 45.6	12.150
15	13 38 4.38	1.8346	5 30 54.2	12.135
16	13 39 54.52	1.8368	5 43 1.8	12.120
17	13 41 44.79	1.8391	5 55 8.6	12.105
18	13 43 35.21	1.8415	6 7 14.4	12.088
19	13 45 25.77	1.8439	6 19 19.2	12.072
20	13 47 16.48	1.8465	6 31 23.0	12.054
21	13 49 7.35	1.8491	6 43 25.7	12.035
22	13 50 58.37	1.8517	6 55 27.2	12.016
23	13 52 49.55	1.8543	7 7 27.6	11.997
24	13 54 40.89	1.8571	S. 7 19 26.8	11.976

THURSDAY 11.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	13 54 40.89	1.8571	S. 7 19 26.8	11.976
1	13 56 32.40	1.8600	7 31 24.7	11.954
2	13 58 24.09	1.8629	7 43 21.3	11.932
3	14 0 15.95	1.8658	7 55 16.6	11.910
4	14 2 7.99	1.8689	8 7 10.5	11.886
5	14 4 0.22	1.8721	8 19 2.9	11.862
6	14 5 52.64	1.8752	8 30 53.9	11.837
7	14 7 45.25	1.8784	8 42 43.3	11.810
8	14 9 38.05	1.8817	8 54 31.1	11.783
9	14 11 31.06	1.8852	9 6 17.3	11.757
10	14 13 24.27	1.8886	9 18 1.9	11.728
11	14 15 17.69	1.8922	9 29 44.7	11.699
12	14 17 11.33	1.8957	9 41 25.8	11.670
13	14 19 5.18	1.8993	9 53 5.1	11.639
14	14 20 59.25	1.9031	10 4 42.5	11.607
15	14 22 53.55	1.9069	10 16 18.0	11.576
16	14 24 48.08	1.9107	10 27 51.6	11.542
17	14 26 42.84	1.9147	10 39 23.1	11.508
18	14 28 37.84	1.9187	10 50 52.6	11.474
19	14 30 33.08	1.9227	11 2 20.0	11.439
20	14 32 28.56	1.9267	11 13 45.3	11.402
21	14 34 24.29	1.9309	11 25 8.3	11.365
22	14 36 20.27	1.9352	11 36 29.1	11.327
23	14 38 16.51	1.9395	S. 11 47 47.5	11.287

FRIDAY 12.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	14 40 13.01	1.9438	S. 11 59 3.6	11.248
1	14 42 9.77	1.9482	12 10 17.3	11.207
2	14 44 6.80	1.9528	12 21 28.5	11.166
3	14 46 4.11	1.9574	12 32 37.2	11.123
4	14 48 1.69	1.9620	12 43 43.3	11.080
5	14 49 59.55	1.9667	12 54 46.8	11.035
6	14 51 57.69	1.9714	13 5 47.5	10.990
7	14 53 56.12	1.9762	13 16 45.6	10.944
8	14 55 54.84	1.9811	13 27 40.8	10.897
9	14 57 53.85	1.9861	13 38 33.2	10.849
10	14 59 53.17	1.9911	13 49 22.7	10.800
11	15 1 52.78	1.9961	14 0 9.2	10.749
12	15 3 52.70	2.0012	14 10 52.6	10.698
13	15 5 52.93	2.0064	14 21 33.0	10.647
14	15 7 53.47	2.0117	14 32 10.2	10.593
15	15 9 54.33	2.0170	14 42 44.2	10.540
16	15 11 55.51	2.0223	14 53 15.0	10.485
17	15 13 57.01	2.0277	15 3 42.4	10.428
18	15 15 58.84	2.0332	15 14 6.4	10.372
19	15 18 1.00	2.0388	15 24 27.0	10.313
20	15 20 3.50	2.0444	15 34 44.0	10.254
21	15 22 6.33	2.0500	15 44 57.5	10.195
22	15 24 9.50	2.0557	15 55 7.4	10.133
23	15 26 13.02	2.0615	16 5 13.5	10.071
24	15 28 16.88	2.0672	S. 16 15 15.9	10.007

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	SATURDAY 13.					MONDAY 15.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	15 28 16.88	2.0672	S. 16 15 15.9	10.007	0	17 14 54.92	2.3830	S. 22 40 4.8	5.539
1	15 30 21.09	2.0731	16 25 14.4	9.943	1	17 17 18.10	2.3897	22 45 33.4	5.414
2	15 32 25.65	2.0790	16 35 9.1	9.878	2	17 19 41.68	2.3963	22 50 54.5	5.288
3	15 34 30.57	2.0850	16 44 59.8	9.811	3	17 22 5.66	2.4029	22 56 8.0	5.160
4	15 36 35.85	2.0910	16 54 46.4	9.742	4	17 24 30.03	2.4094	23 1 13.8	5.031
5	15 38 41.49	2.0971	17 4 28.9	9.674	5	17 26 54.79	2.4158	23 6 11.8	4.901
6	15 40 47.50	2.1032	17 14 7.3	9.604	6	17 29 19.93	2.4222	23 11 1.9	4.769
7	15 42 53.87	2.1092	17 23 41.5	9.533	7	17 31 45.46	2.4287	23 15 44.1	4.637
8	15 45 0.61	2.1154	17 33 11.3	9.461	8	17 34 11.38	2.4351	23 20 18.3	4.502
9	15 47 7.72	2.1217	17 42 36.7	9.387	9	17 36 37.68	2.4414	23 24 44.4	4.367
10	15 49 15.21	2.1280	17 51 57.7	9.312	10	17 39 4.35	2.4477	23 29 2.3	4.230
11	15 51 23.08	2.1343	18 1 14.2	9.237	11	17 41 31.39	2.4538	23 33 12.0	4.092
12	15 53 31.33	2.1407	18 10 26.1	9.159	12	17 43 58.80	2.4599	23 37 13.4	3.953
13	15 55 39.96	2.1471	18 19 33.3	9.081	13	17 46 26.58	2.4660	23 41 6.4	3.813
14	15 57 48.98	2.1535	18 28 35.8	9.002	14	17 48 54.72	2.4720	23 44 51.0	3.672
15	15 59 58.39	2.1600	18 37 33.5	8.921	15	17 51 23.22	2.4779	23 48 27.0	3.528
16	16 2 8.18	2.1665	18 46 26.3	8.839	16	17 53 52.08	2.4838	23 51 54.4	3.384
17	16 4 18.36	2.1730	18 55 14.2	8.756	17	17 56 21.29	2.4897	23 55 13.1	3.239
18	16 6 28.94	2.1797	19 3 57.0	8.671	18	17 58 50.84	2.4953	23 58 23.1	3.092
19	16 8 39.92	2.1862	19 12 34.7	8.586	19	18 1 20.73	2.5009	24 1 24.2	2.945
20	16 10 51.29	2.1928	19 21 7.3	8.499	20	18 3 50.95	2.5065	24 4 16.5	2.797
21	16 13 3.06	2.1995	19 29 34.6	8.411	21	18 6 21.50	2.5119	24 6 59.8	2.647
22	16 15 15.23	2.2062	19 37 56.6	8.322	22	18 8 52.38	2.5173	24 9 34.1	2.496
23	16 17 27.80	2.2129	S. 19 46 13.2	8.231	23	18 11 23.58	2.5227	S. 24 11 59.3	2.344
	SUNDAY 14.					TUESDAY 16.			
0	16 19 40.78	2.2196	S. 19 54 24.3	8.139	0	18 13 55.10	2.5278	S. 24 14 15.4	2.191
1	16 21 54.16	2.2264	20 2 29.9	8.046	1	18 16 26.92	2.5329	24 16 22.2	2.037
2	16 24 7.95	2.2332	20 10 29.8	7.951	2	18 18 59.05	2.5380	24 18 19.8	1.882
3	16 26 22.14	2.2399	20 18 24.0	7.856	3	18 21 31.48	2.5429	24 20 8.0	1.725
4	16 28 36.74	2.2467	20 26 12.5	7.759	4	18 24 4.20	2.5477	24 21 46.8	1.567
5	16 30 51.75	2.2536	20 33 55.1	7.661	5	18 26 37.20	2.5523	24 23 16.1	1.410
6	16 33 7.17	2.2604	20 41 31.8	7.561	6	18 29 10.48	2.5569	24 24 36.0	1.252
7	16 35 23.00	2.2672	20 49 2.4	7.459	7	18 31 44.04	2.5615	24 25 46.3	1.091
8	16 37 39.24	2.2741	20 56 26.9	7.357	8	18 34 17.86	2.5659	24 26 46.9	0.930
9	16 39 55.89	2.2810	21 3 45.3	7.254	9	18 36 51.94	2.5701	24 27 37.9	0.769
10	16 42 12.95	2.2878	21 10 57.4	7.149	10	18 39 26.27	2.5742	24 28 19.2	0.607
11	16 44 30.43	2.2947	21 18 3.2	7.043	11	18 42 0.85	2.5783	24 28 50.7	0.443
12	16 46 48.32	2.3016	21 25 2.6	6.936	12	18 44 35.67	2.5822	24 29 12.3	0.278
13	16 49 6.62	2.3084	21 31 55.5	6.826	13	18 47 10.72	2.5860	24 29 24.1	−0.113
14	16 51 25.33	2.3152	21 38 41.7	6.715	14	18 49 45.99	2.5897	24 29 25.9	+0.052
15	16 53 44.45	2.3222	21 45 21.2	6.603	15	18 52 21.48	2.5932	24 29 17.8	0.218
16	16 56 3.99	2.3290	21 51 54.0	6.491	16	18 54 57.18	2.5967	24 28 59.7	0.385
17	16 58 23.93	2.3357	21 58 20.1	6.377	17	18 57 33.08	2.6000	24 28 31.6	0.552
18	17 0 44.28	2.3426	22 4 39.3	6.261	18	19 0 9.18	2.6032	24 27 53.4	0.721
19	17 3 5.04	2.3494	22 10 51.5	6.144	19	19 2 45.47	2.6062	24 27 5.1	0.890
20	17 5 26.21	2.3562	22 16 56.6	6.026	20	19 5 21.93	2.6091	24 26 6.6	1.059
21	17 7 47.78	2.3629	22 22 54.6	5.907	21	19 7 58.56	2.6119	24 24 58.0	1.228
22	17 10 9.76	2.3697	22 28 45.4	5.785	22	19 10 35.36	2.6147	24 23 39.2	1.399
23	17 12 32.14	2.3763	22 34 28.8	5.662	23	19 13 12.32	2.6172	24 22 10.1	1.570
24	17 14 54.92	2.3830	S. 22 40 4.8	5.539	24	19 15 49.42	2.6195	S. 24 20 30.8	1.741

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	WEDNESDAY 17.					FRIDAY 19.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	19 15 49.42	2.6195	S. 24 20 30.8	1.741	0	21 21 45.56	2.5806	S. 19 41 10.3	9.687
1	19 18 26.66	2.6217	24 18 41.2	1.912	1	21 24 20.29	2.5772	19 31 24.7	9.832
2	19 21 4.03	2.6239	24 16 41.3	2.084	2	21 26 54.82	2.5737	19 21 30.4	9.976
3	19 23 41.53	2.6259	24 14 31.1	2.257	3	21 29 29.13	2.5700	19 11 27.6	10.117
4	19 26 19.14	2.6277	24 12 10.5	2.429	4	21 32 3.22	2.5662	19 1 16.3	10.257
5	19 28 56.86	2.6294	24 9 39.6	2.602	5	21 34 37.08	2.5625	18 50 56.6	10.397
6	19 31 34.67	2.6310	24 6 58.3	2.775	6	21 37 10.72	2.5588	18 40 28.7	10.534
7	19 34 12.57	2.6324	24 4 6.6	2.947	7	21 39 44.14	2.5550	18 29 52.6	10.669
8	19 36 50.56	2.6337	24 1 4.6	3.120	8	21 42 17.32	2.5510	18 19 8.4	10.804
9	19 39 28.62	2.6348	23 57 52.2	3.293	9	21 44 50.26	2.5470	18 8 16.1	10.937
10	19 42 6.74	2.6358	23 54 29.4	3.467	10	21 47 22.96	2.5430	17 57 16.0	11.067
11	19 44 44.92	2.6367	23 50 56.2	3.640	11	21 49 55.42	2.5389	17 46 8.1	11.197
12	19 47 23.15	2.6375	23 47 12.6	3.813	12	21 52 27.63	2.5347	17 34 52.5	11.324
13	19 50 1.42	2.6381	23 43 18.6	3.986	13	21 54 59.59	2.5307	17 23 29.2	11.450
14	19 52 39.72	2.6385	23 39 14.3	4.158	14	21 57 31.31	2.5265	17 11 58.4	11.574
15	19 55 18.04	2.6388	23 34 59.6	4.332	15	22 0 2.77	2.5222	17 0 20.3	11.696
16	19 57 56.38	2.6390	23 30 34.5	4.504	16	22 2 33.98	2.5180	16 48 34.9	11.817
17	20 0 34.72	2.6390	23 25 59.1	4.677	17	22 5 4.93	2.5137	16 36 42.3	11.936
18	20 3 13.06	2.6389	23 21 13.4	4.848	18	22 7 35.62	2.5093	16 24 42.6	12.053
19	20 5 51.39	2.6387	23 16 17.3	5.020	19	22 10 6.05	2.5049	16 12 35.9	12.168
20	20 8 29.71	2.6384	23 11 10.9	5.192	20	22 12 36.22	2.5006	16 0 22.4	12.282
21	20 11 8.00	2.6379	23 5 54.3	5.362	21	22 15 6.12	2.4962	15 48 2.1	12.393
22	20 13 46.26	2.6372	23 0 27.5	5.532	22	22 17 35.76	2.4917	15 35 35.2	12.502
23	20 16 24.47	2.6365	S. 22 54 50.4	5.703	23	22 20 5.13	2.4873	S. 15 23 1.8	12.611
	THURSDAY 18.					SATURDAY 20.			
0	20 19 2.64	2.6357	S. 22 49 3.1	5.872	0	22 22 34.24	2.4829	S. 15 10 21.9	12.718
1	20 21 40.75	2.6346	22 43 5.7	6.042	1	22 25 3.08	2.4784	14 57 35.7	12.822
2	20 24 18.79	2.6334	22 36 58.1	6.210	2	22 27 31.65	2.4739	14 44 43.3	12.923
3	20 26 56.76	2.6322	22 30 40.5	6.377	3	22 29 59.95	2.4695	14 31 44.9	13.023
4	20 29 34.66	2.6309	22 24 12.8	6.545	4	22 32 27.98	2.4650	14 18 40.5	13.122
5	20 32 12.47	2.6293	22 17 35.1	6.711	5	22 34 55.75	2.4605	14 5 30.2	13.219
6	20 34 50.18	2.6277	22 10 47.5	6.876	6	22 37 23.25	2.4561	13 52 14.2	13.313
7	20 37 27.79	2.6260	22 3 50.0	7.041	7	22 39 50.48	2.4516	13 38 52.6	13.405
8	20 40 5.30	2.6242	21 56 42.6	7.206	8	22 42 17.44	2.4472	13 25 25.5	13.496
9	20 42 42.69	2.6222	21 49 25.3	7.369	9	22 44 44.13	2.4427	13 11 53.1	13.586
10	20 45 19.96	2.6202	21 41 58.3	7.531	10	22 47 10.56	2.4382	12 58 15.4	13.672
11	20 47 57.11	2.6180	21 34 21.6	7.692	11	22 49 36.72	2.4337	12 44 32.5	13.756
12	20 50 34.12	2.6157	21 26 35.3	7.852	12	22 52 2.61	2.4292	12 30 44.6	13.839
13	20 53 10.99	2.6132	21 18 39.4	8.012	13	22 54 28.23	2.4248	12 16 51.8	13.920
14	20 55 47.71	2.6107	21 10 33.9	8.170	14	22 56 53.59	2.4205	12 2 54.2	13.998
15	20 58 24.27	2.6081	21 2 19.0	8.327	15	22 59 18.69	2.4161	11 48 52.0	14.074
16	21 1 0.68	2.6054	20 53 54.7	8.482	16	23 1 43.53	2.4117	11 34 45.3	14.149
17	21 3 36.92	2.6026	20 45 21.1	8.637	17	23 4 8.10	2.4074	11 20 34.1	14.222
18	21 6 12.99	2.5997	20 36 38.2	8.792	18	23 6 32.41	2.4031	11 6 18.6	14.292
19	21 8 48.89	2.5968	20 27 46.1	8.944	19	23 8 56.46	2.3987	10 51 59.0	14.361
20	21 11 24.61	2.5937	20 18 44.9	9.096	20	23 11 20.25	2.3945	10 37 35.3	14.427
21	21 14 0.14	2.5906	20 9 34.6	9.246	21	23 13 43.79	2.3902	10 23 7.7	14.492
22	21 16 35.48	2.5873	20 0 15.3	9.395	22	23 16 7.08	2.3860	10 8 36.2	14.555
23	21 19 10.62	2.5840	19 50 47.2	9.512	23	23 18 30.12	2.3818	9 54 1.1	14.615
24	21 21 45.56	2.5806	S. 19 41 10.3	9.687	24	23 20 52.91	2.3777	S. 9 39 22.4	14.674

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	SUNDAY 21.					TUESDAY 23.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	23 20 52.91	2.3777	S. 9 39 22.4	14.674	0	1 11 8.90	2.2383	N. 2 35 23.7	15.232
1	23 23 15.45	2.3737	9 24 40.2	14.731	1	1 13 23.15	2.2369	2 50 36.7	15.201
2	23 25 37.75	2.3696	9 9 54.7	14.785	2	1 15 37.32	2.2355	3 5 47.8	15.167
3	23 27 59.80	2.3655	8 55 6.0	14.837	3	1 17 51.41	2.2342	3 20 56.8	15.132
4	23 30 21.61	2.3615	8 40 14.2	14.888	4	1 20 5.43	2.2330	3 36 3.7	15.097
5	23 32 43.18	2.3576	8 25 19.4	14.937	5	1 22 19.37	2.2318	3 51 8.4	15.059
6	23 35 4.52	2.3537	8 10 21.8	14.982	6	1 24 33.24	2.2306	4 6 10.8	15.021
7	23 37 25.63	2.3498	7 55 21.5	15.027	7	1 26 47.04	2.2295	4 21 10.8	14.980
8	23 39 46.51	2.3460	7 40 18.5	15.070	8	1 29 0.78	2.2285	4 36 8.4	14.937
9	23 42 7.15	2.3422	7 25 13.1	15.110	9	1 31 14.46	2.2275	4 51 3.4	14.894
10	23 44 27.57	2.3385	7 10 5.3	15.149	10	1 33 28.08	2.2266	5 5 55.7	14.849
11	23 46 47.77	2.3348	6 54 55.2	15.186	11	1 35 41.65	2.2257	5 20 45.3	14.803
12	23 49 7.75	2.3312	6 39 43.0	15.220	12	1 37 55.17	2.2249	5 35 32.1	14.756
13	23 51 27.51	2.3276	6 24 28.8	15.253	13	1 40 8.64	2.2242	5 50 16.0	14.706
14	23 53 47.06	2.3241	6 9 12.6	15.284	14	1 42 22.07	2.2236	6 4 56.8	14.655
15	23 56 6.40	2.3206	5 53 54.7	15.312	15	1 44 35.47	2.2230	6 19 34.6	14.603
16	23 58 25.53	2.3172	5 38 35.1	15.339	16	1 46 48.83	2.2223	6 34 9.2	14.550
17	0 0 44.46	2.3138	5 23 14.0	15.364	17	1 49 2.15	2.2218	6 48 40.6	14.495
18	0 3 3.19	2.3105	5 7 51.4	15.387	18	1 51 15.45	2.2215	7 3 8.6	14.438
19	0 5 21.72	2.3072	4 52 27.5	15.408	19	1 53 28.73	2.2211	7 17 33.2	14.382
20	0 7 40.05	2.3040	4 37 2.4	15.427	20	1 55 41.98	2.2207	7 31 54.4	14.323
21	0 9 58.20	2.3009	4 21 36.2	15.445	21	1 57 55.21	2.2204	7 46 12.0	14.262
22	0 12 16.16	2.2977	4 6 9.0	15.461	22	2 0 8.43	2.2202	8 0 25.9	14.201
23	0 14 33.93	2.2947	S. 3 50 40.9	15.474	23	2 2 21.63	2.2200	N. 8 14 36.1	14.138
	MONDAY 22.					WEDNESDAY 24.			
0	0 16 51.52	2.2917	S. 3 35 12.1	15.485	0	2 4 34.83	2.2199	N. 8 28 42.5	14.074
1	0 19 8.93	2.2887	3 19 42.7	15.495	1	2 6 48.02	2.2197	8 42 45.0	14.009
2	0 21 26.17	2.2859	3 4 12.7	15.503	2	2 9 1.20	2.2197	8 56 43.6	13.943
3	0 23 43.24	2.2831	2 48 42.3	15.509	3	2 11 14.39	2.2198	9 10 38.2	13.875
4	0 26 0.14	2.2803	2 33 11.6	15.513	4	2 13 27.58	2.2198	9 24 28.6	13.806
5	0 28 16.88	2.2777	2 17 40.7	15.515	5	2 15 40.77	2.2199	9 38 14.9	13.736
6	0 30 33.46	2.2751	2 2 9.8	15.516	6	2 17 53.97	2.2201	9 51 56.9	13.664
7	0 32 49.89	2.2725	1 46 38.8	15.515	7	2 20 7.18	2.2203	10 5 34.6	13.592
8	0 35 6.16	2.2700	1 31 8.0	15.512	8	2 22 20.41	2.2207	10 19 8.0	13.519
9	0 37 22.29	2.2676	1 15 37.4	15.507	9	2 24 33.66	2.2209	10 32 36.9	13.443
10	0 39 38.27	2.2652	1 0 7.1	15.501	10	2 26 46.92	2.2212	10 46 1.2	13.367
11	0 41 54.11	2.2628	0 44 37.3	15.492	11	2 29 0.21	2.2217	10 59 21.0	13.291
12	0 44 9.81	2.2606	0 29 8.0	15.482	12	2 31 13.52	2.2221	11 12 36.1	13.212
13	0 46 25.38	2.2584	S. 0 13 39.4	15.471	13	2 33 26.86	2.2226	11 25 46.5	13.132
14	0 48 40.82	2.2562	N. 0 1 48.5	15.457	14	2 35 40.23	2.2231	11 38 52.0	13.052
15	0 50 56.13	2.2542	0 17 15.5	15.442	15	2 37 53.63	2.2237	11 51 52.7	12.971
16	0 53 11.32	2.2522	0 32 41.6	15.426	16	2 40 7.07	2.2242	12 4 48.5	12.888
17	0 55 26.39	2.2502	0 48 6.6	15.407	17	2 42 20.54	2.2248	12 17 39.3	12.804
18	0 57 41.35	2.2483	1 3 30.4	15.387	18	2 44 34.05	2.2255	12 30 25.0	12.720
19	0 59 56.20	2.2465	1 18 53.0	15.365	19	2 46 47.60	2.2262	12 43 5.7	12.634
20	1 2 10.94	2.2448	1 34 14.2	15.342	20	2 49 1.20	2.2270	12 55 41.1	12.547
21	1 4 25.58	2.2431	1 49 34.0	15.317	21	2 51 14.84	2.2277	13 8 11.3	12.459
22	1 6 40.12	2.2415	2 4 52.3	15.291	22	2 53 28.53	2.2286	13 20 36.2	12.371
23	1 8 54.56	2.2399	2 20 8.9	15.262	23	2 55 42.27	2.2294	13 32 55.8	12.281
24	1 11 8.90	2.2383	N. 2 35 23.7	15.232	24	2 57 56.06	2.2302	N. 13 45 9.9	12.189

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	THURSDAY 25.					SATURDAY 27.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	2 57 56.06	2.2302	N.13 45 9.9	12.189	0	4 46 18.06	2.2853	N.21 29 42.2	6.899
1	3 0 9.90	2.2312	13 57 18.5	12.097	1	4 48 35.21	2.2862	21 36 32.4	6.773
2	3 2 23.80	2.2322	14 9 21.6	12.005	2	4 50 52.41	2.2872	21 43 15.1	6.648
3	3 4 37.76	2.2331	14 21 19.1	11.912	3	4 53 9.67	2.2881	21 49 50.2	6.522
4	3 6 51.77	2.2340	14 33 11.0	11.817	4	4 55 26.98	2.2888	21 56 17.7	6.396
5	3 9 5.84	2.2351	14 44 57.1	11.721	5	4 57 44.33	2.2896	22 2 37.7	6.270
6	3 11 19.98	2.2362	14 56 37.5	11.625	6	5 0 1.73	2.2903	22 8 50.1	6.143
7	3 13 34.18	2.2372	15 8 12.1	11.527	7	5 2 19.17	2.2911	22 14 54.9	6.017
8	3 15 48.44	2.2382	15 19 40.8	11.429	8	5 4 36.66	2.2918	22 20 52.1	5.889
9	3 18 2.77	2.2393	15 31 3.6	11.330	9	5 6 54.19	2.2924	22 26 41.6	5.761
10	3 20 17.16	2.2404	15 42 20.4	11.229	10	5 9 11.75	2.2930	22 32 23.4	5.633
11	3 22 31.62	2.2416	15 53 31.1	11.128	11	5 11 29.35	2.2936	22 37 57.6	5.505
12	3 24 46.15	2.2427	16 4 35.8	11.027	12	5 13 46.98	2.2941	22 43 24.0	5.376
13	3 27 0.75	2.2439	16 15 34.3	10.924	13	5 16 4.64	2.2946	22 48 42.7	5.247
14	3 29 15.42	2.2451	16 26 26.7	10.821	14	5 18 22.33	2.2950	22 53 53.7	5.118
15	3 31 30.16	2.2463	16 37 12.8	10.717	15	5 20 40.04	2.2954	22 58 56.9	4.989
16	3 33 44.98	2.2476	16 47 52.7	10.612	16	5 22 57.78	2.2957	23 3 52.4	4.860
17	3 35 59.87	2.2488	16 58 26.3	10.507	17	5 25 15.53	2.2960	23 8 40.1	4.730
18	3 38 14.83	2.2500	17 8 53.5	10.399	18	5 27 33.30	2.2962	23 13 20.0	4.600
19	3 40 29.87	2.2512	17 19 14.2	10.292	19	5 29 51.08	2.2965	23 17 52.1	4.470
20	3 42 44.98	2.2525	17 29 28.5	10.184	20	5 32 8.88	2.2967	23 22 16.4	4.340
21	3 45 0.17	2.2537	17 39 36.3	10.076	21	5 34 26.68	2.2967	23 26 32.9	4.210
22	3 47 15.43	2.2550	17 49 37.6	9.967	22	5 36 44.49	2.2968	23 30 41.6	4.079
23	3 49 30.77	2.2562	N.17 59 32.3	9.856	23	5 39 2.30	2.2968	N.23 34 42.4	3.948
	FRIDAY 26.					SUNDAY 28.			
0	3 51 46.18	2.2575	N.18 9 20.3	9.744	0	5 41 20.11	2.2967	N.23 38 35.4	3.818
1	3 54 1.67	2.2588	18 19 1.6	9.632	1	5 43 37.91	2.2967	23 42 20.6	3.687
2	3 56 17.24	2.2601	18 28 36.2	9.521	2	5 45 55.71	2.2966	23 45 57.9	3.556
3	3 58 32.88	2.2613	18 38 4.1	9.407	3	5 48 13.50	2.2963	23 49 27.3	3.425
4	4 0 48.60	2.2626	18 47 25.1	9.293	4	5 50 31.27	2.2961	23 52 48.9	3.294
5	4 3 4.39	2.2638	18 56 39.3	9.180	5	5 52 49.03	2.2957	23 56 2.6	3.162
6	4 5 20.26	2.2651	19 5 46.7	9.065	6	5 55 6.76	2.2953	23 59 8.4	3.032
7	4 7 36.20	2.2663	19 14 47.1	8.948	7	5 57 24.47	2.2949	24 2 6.4	2.901
8	4 9 52.22	2.2677	19 23 40.5	8.832	8	5 59 42.15	2.2945	24 4 56.5	2.769
9	4 12 8.32	2.2689	19 32 27.0	8.716	9	6 1 59.81	2.2940	24 7 38.7	2.638
10	4 14 24.49	2.2701	19 41 6.4	8.598	10	6 4 17.43	2.2933	24 10 13.1	2.507
11	4 16 40.73	2.2712	19 49 38.8	8.481	11	6 6 35.01	2.2927	24 12 39.6	2.376
12	4 18 57.04	2.2725	19 58 4.1	8.362	12	6 8 52.55	2.2920	24 14 58.2	2.245
13	4 21 13.42	2.2737	20 6 22.2	8.242	13	6 11 10.05	2.2912	24 17 9.0	2.114
14	4 23 29.88	2.2748	20 14 33.2	8.123	14	6 13 27.50	2.2904	24 19 11.9	1.983
15	4 25 46.41	2.2760	20 22 37.0	8.003	15	6 15 44.90	2.2895	24 21 7.0	1.853
16	4 28 3.00	2.2771	20 30 33.6	7.882	16	6 18 2.24	2.2886	24 22 54.3	1.722
17	4 30 19.66	2.2782	20 38 22.9	7.761	17	6 20 19.53	2.2876	24 24 33.7	1.591
18	4 32 36.39	2.2793	20 46 4.9	7.639	18	6 22 36.75	2.2864	24 26 5.3	1.461
19	4 34 53.18	2.2803	20 53 39.6	7.517	19	6 24 53.90	2.2853	24 27 29.0	1.331
20	4 37 10.03	2.2814	21 1 6.9	7.394	20	6 27 10.99	2.2842	24 28 44.9	1.201
21	4 39 26.95	2.2825	21 8 26.9	7.271	21	6 29 28.00	2.2829	24 29 53.0	1.071
22	4 41 43.93	2.2835	21 15 39.4	7.147	22	6 31 44.94	2.2817	24 30 53.4	0.941
23	4 44 0.97	2.2844	21 22 44.5	7.023	23	6 34 1.80	2.2803	24 31 46.0	0.812
24	4 46 18.06	2.2853	N.21 29 42.2	6.899	24	6 36 18.58	2.2789	N.24 32 30.8	0.682

GREENWICH MEAN TIME.

PHASES OF THE MOON.

		d	h	m
○ Full Moon	Feb.	4	20	24.9
☾ Last Quarter		13	0	46.9
● New Moon		19	22	52.1
☽ First Quarter		26	14	49.1

		d	h
☾ Apogee	Feb.	7	17.3
☾ Perigee		20	11.4

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIʰ	P. L. of Diff.	VIʰ	P. L. of Diff.	IXʰ	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
1	α Pegasi	W.	95 59 13	3213	97 25 7	3225	98 50 47	3236	100 16 13	3248
	SATURN	W.	82 35 7	2831	84 8 54	2840	85 42 30	2848	87 15 55	2857
	α Arietis	W.	52 52 58	2994	54 23 18	2996	55 53 36	2997	57 23 52	2999
	Aldebaran	W.	20 56 34	2872	22 29 29	2872	24 2 24	2873	25 35 17	2875
	Regulus	E.	59 53 36	2811	58 19 22	2820	56 45 20	2829	55 11 29	2838
	JUPITER	E.	74 9 57	2772	72 34 52	2780	70 59 58	2788	69 25 15	2797
	Spica	E.	113 53 39	2829	112 19 49	2838	110 46 10	2845	109 12 41	2852
2	α Pegasi	W.	107 19 33	3319	108 43 22	3335	110 6 53	3352	111 30 5	3369
	SATURN	W.	95 0 21	2897	96 32 44	2905	98 4 57	2912	99 37 0	2920
	α Arietis	W.	64 54 29	3014	66 24 24	3018	67 54 14	3022	69 24 0	3026
	Aldebaran	W.	33 18 52	2894	34 51 19	2899	36 23 40	2904	37 55 54	2909
	Regulus	E.	47 25 6	2882	45 52 23	2891	44 19 52	2899	42 47 31	2907
	JUPITER	E.	61 34 20	2837	60 0 40	2845	58 27 10	2852	56 53 50	2859
	Spica	E.	101 27 39	2890	99 55 7	2897	98 22 44	2904	96 50 30	2911
3	SATURN	W.	107 15 0	2955	108 46 9	2962	110 17 10	2968	111 48 2	2974
	α Arietis	W.	76 51 25	3050	78 20 36	3055	79 49 42	3060	81 18 41	3065
	Aldebaran	W.	45 35 22	2937	47 6 54	2942	48 38 19	2948	50 9 37	2953
	Regulus	E.	35 8 33	2952	33 37 20	2962	32 6 19	2972	30 35 30	2982
	JUPITER	E.	49 9 31	2896	47 37 7	2903	46 4 53	2910	44 32 47	2918
	Spica	E.	89 11 34	2945	87 40 12	2952	86 8 59	2958	84 37 54	2965
4	α Arietis	W.	88 41 55	3092	90 10 14	3098	91 38 25	3104	93 6 30	3110
	Aldebaran	W.	57 44 25	2981	59 15 2	2986	60 45 32	2991	62 15 56	2996
	JUPITER	E.	36 54 37	2954	35 23 27	2962	33 52 26	2969	32 21 35	2977
	Spica	E.	77 4 30	2996	75 34 13	3002	74 4 3	3008	72 34 0	3014
	Antares	E.	122 58 24	3000	121 28 11	3004	119 58 3	3009	118 28 1	3013
5	α Arietis	W.	100 25 6	3140	101 52 27	3147	103 19 40	3153	104 46 46	3159
	Aldebaran	W.	69 46 22	3021	71 16 9	3026	72 45 50	3030	74 15 26	3034
	Pollux	W.	25 46 30	3071	27 15 15	3071	28 44 0	3070	30 12 46	3070
	Spica	E.	65 5 39	3043	63 36 20	3049	62 7 9	3055	60 38 4	3060
	Antares	E.	110 59 14	3035	109 29 45	3040	108 0 22	3044	106 31 4	3048
	MARS	E.	119 43 59	3258	118 18 58	3262	116 54 2	3267	115 29 12	3272
6	Aldebaran	W.	81 42 8	3054	83 11 14	3058	84 40 14	3061	86 9 11	3065
	Pollux	W.	37 36 27	3076	39 5 6	3077	40 33 44	3079	42 2 19	3081
	Spica	E.	53 14 24	3089	51 46 0	3095	50 17 44	3100	48 49 34	3105
	Antares	E.	99 5 46	3067	97 36 56	3071	96 8 11	3074	94 39 30	3077
	MARS	E.	108 26 24	3294	107 2 6	3298	105 37 52	3301	104 13 42	3305
7	Aldebaran	W.	93 33 0	3078	95 1 36	3080	96 30 9	3082	97 58 40	3085
	Pollux	W.	49 24 45	3088	50 53 9	3090	52 21 31	3091	53 49 52	3092
	Regulus	W.	13 47 11	3250	15 12 21	3224	16 38 2	3203	18 4 8	3185
	Spica	E.	41 30 26	3134	40 2 58	3140	38 35 37	3147	37 8 24	3155
	Antares	E.	87 16 58	3091	85 48 38	3093	84 20 20	3095	82 52 5	3097
	MARS	E.	97 13 49	3319	95 50 0	3322	94 26 14	3324	93 2 31	3325
8	Aldebaran	W.	105 20 45	3090	106 49 7	3091	108 17 28	3091	109 45 49	3090
	Pollux	W.	61 11 22	3094	62 39 39	3094	64 7 56	3093	65 36 14	3092
	Regulus	W.	25 18 43	3138	26 46 7	3132	28 13 39	3127	29 41 17	3123

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XV^h	P. L. of Diff.	XVIII^h	P. L. of Diff.	XXI^h	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
1	*a* Pegasi	W.	101 41 25	3262	103 6 21	3275	104 31 2	3289	105 55 26	3304
	SATURN	W.	88 49 9	2865	90 22 12	2873	91 55 5	2881	93 27 48	2889
	a Arietis	W.	58 54 6	3001	60 24 17	3004	61 54 25	3007	63 24 29	3010
	Aldebaran	W.	27 8 8	2877	28 40 56	2880	30 13 40	2884	31 46 19	2889
	Regulus	E.	53 37 50	2846	52 4 22	2855	50 31 6	2864	48 58 0	2873
	JUPITER	E.	67 50 43	2805	66 16 22	2813	64 42 11	2821	63 8 10	2829
	Spica	E.	107 39 21	2860	106 6 11	2868	104 33 11	2875	103 0 20	2883
2	*a* Pegasi	W.	112 52 56	3388	114 15 26	3407	115 37 35	3427	116 59 21	3447
	SATURN	W.	101 8 54	2927	102 40 39	2934	104 12 15	2941	105 43 42	2948
	a Arietis	W.	70 53 40	3030	72 23 15	3035	73 52 44	3040	75 22 7	3045
	Aldebaran	W.	39 28 2	2914	41 0 3	2920	42 31 57	2926	44 3 43	2931
	Regulus	E.	41 15 21	2916	39 43 22	2925	38 11 34	2934	36 39 58	2943
	JUPITER	E.	55 20 39	2867	53 47 38	2874	52 14 46	2882	50 42 4	2889
	Spica	E.	95 18 25	2918	93 46 29	2925	92 14 42	2932	90 43 4	2939
3	SATURN	W.	113 18 47	2981	114 49 23	2987	116 19 52	2994	117 50 12	3000
	a Arietis	W.	82 47 33	3070	84 16 19	3076	85 44 57	3082	87 13 29	3087
	Aldebaran	W.	51 40 49	2959	53 11 53	2964	54 42 50	2969	56 13 41	2975
	Regulus	E.	29 4 54	2993	27 34 32	3005	26 4 25	3017	24 34 33	3028
	JUPITER	E.	43 0 51	2925	41 29 4	2932	39 57 26	2939	38 25 57	2946
	Spica	E.	83 6 57	2971	81 36 9	2977	80 5 28	2984	78 34 55	2990
4	*a* Arietis	W.	94 34 28	3116	96 2 18	3122	97 30 1	3128	98 57 37	3134
	Aldebaran	W.	63 46 14	3001	65 16 25	3006	66 46 30	3011	68 16 29	3016
	JUPITER	E.	30 50 54	2985	29 20 23	2994	27 50 3	3003	26 19 54	3013
	Spica	E.	71 4 5	3020	69 34 17	3026	68 4 37	3032	66 35 4	3038
	Antares	E.	116 58 4	3018	115 28 13	3022	113 58 28	3026	112 28 48	3031
5	*a* Arietis	W.	106 13 44	3165	107 40 35	3172	109 7 18	3178	110 33 53	3185
	Aldebaran	W.	75 44 57	3039	77 14 22	3043	78 43 42	3047	80 12 57	3050
	Pollux	W.	31 41 32	3071	33 10 17	3072	34 39 2	3073	36 7 45	3074
	Spica	E.	59 9 6	3066	57 40 15	3072	56 11 31	3078	54 42 54	3083
	Antares	E.	105 1 50	3052	103 32 42	3056	102 3 38	3060	100 34 40	3064
	MARS	E.	114 4 28	3277	112 39 49	3282	111 15 16	3286	109 50 48	3290
6	Aldebaran	W.	87 38 4	3068	89 6 53	3071	90 35 38	3073	92 4 21	3076
	Pollux	W.	43 30 52	3082	44 59 23	3084	46 27 52	3086	47 56 19	3087
	Spica	E.	47 21 30	3111	45 53 33	3117	44 25 44	3123	42 58 1	3129
	Antares	E.	93 10 52	3080	91 42 18	3083	90 13 48	3086	88 45 21	3089
	MARS	E.	102 49 36	3308	101 25 34	3311	100 1 36	3314	98 37 41	3317
7	Aldebaran	W.	99 27 8	3087	100 55 34	3088	102 23 59	3089	103 52 22	3089
	Pollux	W.	55 18 11	3093	56 46 30	3094	58 14 48	3094	59 43 5	3094
	Regulus	W.	19 30 35	3170	20 57 20	3159	22 24 18	3150	23 51 27	3144
	Spica	E.	35 41 21	3163	34 14 27	3170	32 47 42	3179	31 21 7	3189
	Antares	E.	81 23 52	3099	79 55 41	3100	78 27 32	3101	76 59 24	3102
	MARS	E.	91 38 49	3327	90 15 9	3329	88 51 31	3330	87 27 54	3330
8	Aldebaran	W.	111 14 11	3090	112 42 33	3089	114 10 55	3088	115 39 19	3087
	Pollux	W.	67 4 33	3091	68 32 53	3090	70 1 14	3088	71 29 38	3087
	Regulus	W.	31 8 59	3118	32 36 47	3114	34 4 40	3110	35 32 38	3105

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.			P. L. of Diff.	IIIh			P. L. of Diff.	VIh			P. L of Diff.	IXh			P. L. of Diff.
			°	′	″		°	′	″		°	′	″		°	′	″	
8	Spica	E.	29	54	44	3199	28	28	34	3211	27	2	38	3225	25	36	59	3242
	Antares	E.	75	31	17	3103	74	3	11	3104	72	35	7	3104	71	7	2	3104
	Mars	E.	86	4	17	3331	84	40	41	3332	83	17	6	3331	81	53	30	3331
	a Aquilæ	E.	118	38	27	4065	117	27	51	4039	116	16	49	4014	115	5	23	3991
9	Pollux	W.	72	58	4	3085	74	26	32	3082	75	55	3	3079	77	23	38	3076
	Regulus	W.	37	0	41	3101	38	28	49	3097	39	57	2	3093	41	25	21	3089
	Jupiter	W.	23	36	3	3082	25	4	35	3073	26	33	17	3066	28	2	8	3060
	Antares	E.	63	46	32	3100	62	18	23	3099	60	50	12	3097	59	21	59	3095
	Mars	E.	74	55	18	3324	73	31	34	3321	72	7	47	3318	70	43	57	3315
	a Aquilæ	E.	109	3	1	3897	107	49	38	3880	106	35	58	3865	105	22	3	3851
	Sun	E.	134	33	21	3481	133	12	36	3478	131	51	47	3474	130	30	54	3470
10	Pollux	W.	84	47	40	3055	86	16	44	3050	87	45	55	3044	89	15	13	3038
	Regulus	W.	48	48	19	3062	50	17	14	3056	51	46	17	3050	53	15	28	3043
	Jupiter	W.	35	28	26	3026	36	58	6	3019	38	27	55	3012	39	57	53	3004
	Antares	E.	52	0	11	3081	50	31	38	3077	49	3	1	3073	47	34	19	3069
	Mars	E.	63	43	41	3294	62	19	22	3288	60	54	57	3282	59	30	25	3276
	a Aquilæ	E.	99	9	3	3790	97	53	50	3779	96	38	26	3769	95	22	52	3760
	Sun	E.	123	45	16	3445	122	23	50	3439	121	2	17	3433	119	40	38	3426
11	Pollux	W.	96	43	46	3002	98	13	56	2993	99	44	17	2985	101	14	49	2976
	Regulus	W.	60	43	35	3004	62	13	43	2995	63	44	2	2986	65	14	32	2977
	Jupiter	W.	47	30	8	2964	49	1	6	2954	50	32	16	2945	52	3	38	2935
	Antares	E.	40	9	31	3047	38	40	17	3043	37	10	57	3039	35	41	32	3034
	Mars	E.	52	25	40	3237	51	0	15	3228	49	34	39	3219	48	8	52	3209
	a Aquilæ	E.	89	2	40	3718	87	46	12	3711	86	29	37	3705	85	12	55	3699
	Sun	E.	112	50	13	3384	111	27	39	3375	110	4	54	3365	108	41	58	3355
12	Pollux	W.	108	50	32	2924	110	22	21	2912	111	54	25	2900	113	26	44	2888
	Regulus	W.	72	50	12	2922	74	22	2	2910	75	54	8	2898	77	26	30	2885
	Jupiter	W.	59	43	47	2880	61	16	32	2868	62	49	32	2855	64	22	49	2842
	Spica	W.	19	36	15	3153	21	3	20	3110	22	31	17	3073	23	59	59	3040
	Mars	E.	40	56	52	3153	39	29	47	3140	38	2	26	3127	36	34	50	3113
	a Aquilæ	E.	78	47	59	3677	77	30	47	3674	76	13	32	3672	74	56	15	3671
	Sun	E.	101	44	9	3296	100	19	53	3283	98	55	23	3270	97	30	37	3256
13	Regulus	W.	85	12	35	2815	86	46	43	2800	88	21	10	2785	89	55	58	2769
	Jupiter	W.	72	13	32	2772	73	48	36	2757	75	24	0	2741	76	59	45	2726
	Spica	W.	31	32	58	2904	33	5	12	2881	34	37	55	2859	36	11	7	2837
	Mars	E.	29	12	34	3041	27	43	12	3025	26	13	30	3009	24	43	28	2993
	a Aquilæ	E.	68	29	53	3681	67	12	45	3686	65	55	43	3693	64	38	49	3702
	Sun	E.	90	22	32	3181	88	56	1	3165	87	29	10	3148	86	1	59	3131
14	Regulus	W.	97	55	14	2687	99	32	12	2669	101	9	34	2651	102	47	19	2633
	Jupiter	W.	85	3	50	2643	86	41	47	2626	88	20	7	2608	89	58	52	2590
	Spica	W.	44	4	6	2732	45	40	4	2711	47	16	29	2690	48	53	22	2670
	a Aquilæ	E.	58	17	24	3781	57	2	2	3805	55	47	5	3832	54	32	36	3864
	Sun	E.	78	40	47	3042	77	11	26	3023	75	41	42	3004	74	11	34	2985
15	Regulus	W.	111	2	15	2542	112	42	30	2523	114	23	11	2504	116	4	18	2485
	Jupiter	W.	98	18	49	2498	100	0	5	2479	101	41	48	2460	103	23	57	2441

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XV^{h}	P. L. of Diff.	XVIII^{h}	P. L. of Diff.	XXI^{h}	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
8	Spica	E.	24 11 39	3262	22 46 42	3285	21 22 12	3312	19 58 14	3345
	Antares	E.	69 38 57	3104	68 10 52	3103	66 42 46	3102	65 14 40	3101
	MARS	E.	80 29 54	3330	79 6 17	3329	77 42 39	3327	76 18 59	3326
	α Aquilæ	E.	113 53 35	3970	112 41 26	3950	111 28 56	3931	110 16 7	3914
9	Pollux	W.	78 52 17	3073	80 21 0	3069	81 49 48	3065	83 18 41	3060
	Regulus	W.	42 53 41	3084	44 22 13	3079	45 50 48	3073	47 19 30	3068
	JUPITER	W.	29 31 7	3053	31 0 14	3046	32 29 30	3039	33 58 54	3033
	Antares	E.	57 53 44	3093	56 25 26	3090	54 57 5	3087	53 28 40	3084
	MARS	E.	69 20 2	3312	67 56 4	3308	66 32 1	3304	65 7 54	3299
	α Aquilæ	E.	104 7 54	3838	102 53 31	3825	101 38 54	3813	100 24 4	3801
	SUN	E.	129 9 57	3466	127 48 55	3461	126 27 48	3456	125 6 35	3451
10	Pollux	W.	90 44 39	3032	92 14 12	3025	93 43 54	3018	95 13 45	3010
	Regulus	W.	54 44 47	3036	56 14 14	3029	57 43 51	3021	59 13 38	3013
	JUPITER	W.	41 28 1	2997	42 58 18	2989	44 28 44	2981	45 59 21	2973
	Antares	E.	46 5 32	3065	44 36 39	3061	43 7 42	3056	41 38 39	3052
	MARS	E.	58 5 45	3269	56 40 57	3262	55 16 1	3254	53 50 55	3246
	α Aquilæ	E.	94 7 8	3751	92 51 14	3743	91 35 12	3734	90 19 0	3726
	SUN	E.	118 18 51	3418	116 56 55	3410	115 34 51	3402	114 12 37	3393
11	Pollux	W.	102 45 32	2966	104 16 27	2956	105 47 35	2945	107 18 57	2935
	Regulus	W.	66 45 13	2967	68 16 7	2956	69 47 15	2945	71 18 36	2934
	JUPITER	W.	53 35 13	2924	55 7 1	2914	56 39 2	2903	58 11 17	2891
	Antares	E.	34 12 1	3030	32 42 26	3026	31 12 46	3023	29 43 2	3021
	MARS	E.	46 42 54	3198	45 16 43	3188	43 50 20	3177	42 23 43	3165
	α Aquilæ	E.	83 56 6	3693	82 39 11	3689	81 22 12	3684	80 5 8	3680
	SUN	E.	107 18 50	3344	105 55 30	3333	104 31 57	3321	103 8 10	3309
12	Pollux	W.	114 59 18	2876	116 32 8	2862	118 5 15	2849	119 38 39	2835
	Regulus	W.	78 59 8	2872	80 32 3	2858	82 5 15	2844	83 38 46	2830
	JUPITER	W.	65 56 22	2829	67 30 12	2815	69 4 20	2801	70 38 47	2787
	Spica	W.	25 29 22	3009	26 59 24	2980	28 30 3	2953	30 1 15	2928
	MARS	E.	35 6 57	3100	33 38 47	3086	32 10 21	3072	30 41 37	3056
	α Aquilæ	E.	73 38 57	3670	72 21 38	3671	71 4 21	3673	69 47 5	3677
	SUN	E.	96 5 35	3242	94 40 16	3227	93 14 39	3212	91 48 45	3197
13	Regulus	W.	91 31 6	2753	93 6 35	2737	94 42 26	2720	96 18 39	2704
	JUPITER	W.	78 35 50	2710	80 12 17	2694	81 49 5	2677	83 26 16	2660
	Spica	W.	37 44 48	2815	39 18 57	2794	40 53 32	2773	42 28 35	2752
	MARS	E.	23 13 6	2976	21 42 23	2958	20 11 18	2941	18 39 51	2923
	α Aquilæ	E.	63 22 4	3713	62 5 30	3727	60 49 11	3743	59 33 8	3761
	SUN	E.	84 34 27	3114	83 6 35	3096	81 38 21	3078	80 9 45	3060
14	Regulus	W.	104 25 29	2615	106 4 3	2597	107 43 2	2579	109 22 26	2561
	JUPITER	W.	91 38 1	2572	93 17 35	2553	94 57 34	2535	96 37 58	2516
	Spica	W.	50 30 42	2649	52 8 30	2629	53 46 45	2608	55 25 29	2588
	α Aquilæ	E.	53 18 40	3902	52 5 22	3945	50 52 48	3993	49 41 2	4045
	SUN	E.	72 41 2	2965	71 10 6	2946	69 38 45	2926	68 6 59	2906
15	Regulus	W.	117 45 52	2467	119 27 52	2448	121 10 18	2429	122 53 11	2411
	JUPITER	W.	105 6 33	2422	106 49 36	2403	108 33 6	2384	110 17 3	2366

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh	P. L. of Diff.	VIh	P. L. of Diff.	IXh	P. L. of Diff
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
15	Spica	W.	57 4 40	2567	58 44 20	2547	60 24 27	2527	62 5 2	2507
	Sun	E.	66 34 48	2886	65 2 11	2866	63 29 9	2846	61 55 41	2825
16	Jupiter	W.	112 1 27	2347	113 46 18	2328	115 31 36	2310	117 17 21	2292
	Spica	W.	70 35 4	2407	72 18 29	2387	74 2 22	2368	75 46 43	2349
	Sun	E.	54 1 47	2726	52 25 42	2707	50 49 11	2688	49 12 15	2669
17	Spica	W.	84 35 18	2256	86 22 21	2239	88 9 50	2223	89 57 44	2206
	Sun	E.	41 1 20	2580	39 21 58	2565	37 42 15	2550	36 2 11	2535
22	Sun	W.	29 34 28	2389	31 18 19	2394	33 2 1	2401	34 45 34	2410
	Aldebaran	E.	65 46 10	2043	63 53 43	2055	62 1 34	2066	60 9 42	2077
	Pollux	E.	109 55 18	2043	108 2 51	2053	106 10 39	2063	104 18 43	2074
23	Sun	W.	43 19 57	2465	45 2 0	2478	46 43 44	2492	48 25 8	2507
	Aldebaran	E.	50 55 11	2145	49 5 21	2161	47 15 55	2177	45 26 52	2193
	Pollux	E.	95 3 33	2137	93 13 31	2152	91 23 50	2167	89 34 32	2181
	Regulus	E.	131 3 46	2145	129 13 55	2158	127 24 24	2172	125 35 15	2186
24	Sun	W.	56 46 46	2588	58 25 58	2605	60 4 46	2623	61 43 10	2640
	Saturn	W.	23 31 21	2309	25 17 7	2324	27 2 32	2338	28 47 36	2353
	Aldebaran	E.	36 28 5	2284	34 41 42	2304	32 55 48	2324	31 10 24	2346
	Pollux	E.	80 33 47	2262	78 46 51	2278	77 0 19	2295	75 14 12	2312
	Regulus	E.	116 34 57	2263	114 48 3	2279	113 1 33	2296	111 15 28	2313
	Jupiter	E.	128 11 22	2223	126 23 28	2239	124 35 58	2255	122 48 52	2272
25	Sun	W.	69 49 6	2732	71 25 4	2750	73 0 37	2769	74 35 46	2787
	Saturn	W.	37 27 20	2433	39 10 7	2450	40 52 30	2467	42 34 30	2484
	Pollux	E.	66 29 58	2401	64 46 24	2418	63 3 15	2436	61 20 31	2454
	Regulus	E.	102 31 9	2398	100 47 31	2415	99 4 18	2433	97 21 30	2450
	Jupiter	E.	113 59 28	2355	112 14 49	2372	110 30 34	2389	108 46 44	2406
26	Sun	W.	82 25 30	2879	83 58 16	2897	85 30 39	2915	87 2 39	2932
	Saturn	W.	50 58 33	2569	52 38 11	2585	54 17 27	2601	55 56 21	2618
	Pollux	E.	52 53 10	2543	51 12 56	2561	49 33 7	2578	47 53 42	2595
	Regulus	E.	88 53 32	2535	87 13 8	2553	85 33 8	2569	83 53 30	2585
	Jupiter	E.	100 13 35	2490	98 32 8	2507	96 51 4	2523	95 10 23	2539
27	Sun	W.	94 37 10	3018	96 7 0	3034	97 36 30	3051	99 5 40	3067
	Saturn	W.	64 5 20	2696	65 42 5	2711	67 18 30	2726	68 54 35	2741
	α Arietis	W.	37 55 0	2984	39 25 33	2978	40 56 14	2973	42 27 1	2970
	Pollux	E.	39 42 31	2682	38 5 27	2699	36 28 46	2716	34 52 28	2734
	Regulus	E.	75 40 52	2665	74 3 25	2680	72 26 18	2695	70 49 31	2710
	Jupiter	E.	86 52 28	2617	85 13 57	2632	83 35 46	2646	81 57 54	2661
28	Sun	W.	106 26 47	3142	107 54 6	3156	109 21 8	3170	110 47 53	3184
	Saturn	W.	76 50 20	2809	78 24 36	2822	79 58 35	2835	81 32 18	2847
	α Arietis	W.	50 1 17	2975	51 32 1	2978	53 2 41	2983	54 33 15	2988
	Aldebaran	W.	18 7 4	2878	19 39 51	2876	21 12 40	2876	22 45 29	2878
	Regulus	E.	62 50 25	2779	61 15 30	2793	59 40 53	2806	58 6 33	2818
	Jupiter	E.	73 53 21	2729	72 17 20	2742	70 41 36	2754	69 6 8	2767
	Spica	E.	116 50 20	2799	115 15 51	2811	113 41 37	2823	112 7 39	2834

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XV^{h}	P. L. of Diff.	XVIII^{h}	P. L. of Diff.	XXI^{h}	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
15	Spica	W.	63 46 6	2487	65 27 38	2467	67 9 38	2446	68 52 7	2426
	SUN	E.	60 21 46	2806	58 47 26	2786	57 12 39	2766	55 37 26	2746
16	JUPITER	W.	119 3 33	2274	120 50 11	2256	122 37 15	2238	124 24 45	2220
	Spica	W.	77 31 32	2330	79 16 48	2311	81 2 31	2293	82 48 41	2274
	SUN	E.	47 34 53	2650	45 57 6	2632	44 18 54	2615	42 40 19	2597
17	Spica	W.	91 46 2	2190	93 34 44	2175	95 23 49	2160	97 13 17	2145
	SUN	E.	34 21 46	2522	32 41 3	2510	31 0 4	2499	29 18 50	2489
22	SUN	W.	36 28 55	2419	38 12 3	2429	39 54 57	2440	41 37 35	2452
	Aldebaran	E.	58 18 8	2090	56 26 53	2103	54 35 58	2116	52 45 24	2130
	Pollux	E.	102 27 4	2086	100 35 43	2098	98 44 40	2111	96 53 56	2124
23	SUN	W.	50 6 11	2522	51 46 53	2538	53 27 13	2554	55 7 11	2571
	Aldebaran	E.	43 38 14	2210	41 50 2	2228	40 2 16	2246	38 14 57	2265
	Pollux	E.	87 45 36	2196	85 57 3	2212	84 8 54	2228	82 21 8	2245
	Regulus	E.	123 46 27	2201	121 58 1	2216	120 9 57	2231	118 22 15	2247
24	SUN	W.	63 21 10	2659	64 58 45	2676	66 35 57	2695	68 12 44	2713
	SATURN	W.	30 32 18	2368	32 16 38	2384	34 0 35	2401	35 44 9	2417
	Aldebaran	E.	29 25 32	2369	27 41 13	2393	25 57 28	2418	24 14 18	2443
	Pollux	E.	73 28 30	2330	71 43 14	2347	69 58 23	2365	68 13 58	2383
	Regulus	E.	109 29 47	2330	107 44 31	2347	105 59 39	2364	104 15 12	2381
	JUPITER	E.	121 2 11	2288	119 15 54	2304	117 30 1	2321	115 44 32	2338
25	SUN	W.	76 10 31	2806	77 44 51	2824	79 18 48	2842	80 52 21	2861
	SATURN	W.	44 16 6	2501	45 57 18	2518	47 38 6	2535	49 18 31	2552
	Pollux	E.	59 38 13	2472	57 56 20	2489	56 14 52	2507	54 33 49	2525
	Regulus	E.	95 39 6	2467	93 57 7	2484	92 15 31	2501	90 34 20	2518
	JUPITER	E.	107 3 18	2424	105 20 17	2440	103 37 39	2457	101 55 25	2474
26	SUN	W.	88 34 17	2950	90 5 32	2967	91 36 26	2984	93 6 59	3001
	SATURN	W.	57 34 52	2634	59 13 1	2650	60 50 48	2666	62 28 14	2681
	Pollux	E.	46 14 40	2613	44 36 3	2630	42 57 49	2647	41 19 58	2665
	Regulus	E.	82 14 14	2601	80 35 21	2617	78 56 50	2633	77 18 40	2649
	JUPITER	E.	93 30 4	2555	91 50 8	2571	90 10 33	2587	88 31 20	2602
27	SUN	W.	100 34 31	3082	102 3 2	3097	103 31 15	3112	104 59 10	3127
	SATURN	W.	70 30 21	2755	72 5 48	2769	73 40 56	2782	75 15 47	2796
	a Arietis	W.	43 57 52	2969	45 28 44	2968	46 59 37	2969	48 30 29	2972
	Pollux	E.	33 16 34	2752	31 41 3	2770	30 5 56	2788	28 31 12	2806
	Regulus	E.	69 13 4	2724	67 36 56	2739	66 1 8	2753	64 25 38	2766
	JUPITER	E.	80 20 22	2675	78 43 9	2689	77 6 15	2703	75 29 39	2716
28	SUN	W.	112 14 22	3197	113 40 35	3209	115 6 33	3222	116 32 16	3235
	SATURN	W.	83 5 45	2859	84 38 56	2871	86 11 52	2882	87 44 34	2893
	a Arietis	W.	56 3 43	2993	57 34 4	2998	59 4 19	3004	60 34 27	3010
	Aldebaran	W.	24 18 15	2881	25 50 58	2885	27 23 36	2890	28 56 7	2896
	Regulus	E.	56 32 29	2831	54 58 42	2843	53 25 10	2855	51 51 53	2867
	JUPITER	E.	67 30 57	2779	65 56 2	2791	64 21 22	2802	62 46 57	2813
	Spica	E.	110 33 55	2845	109 0 26	2856	107 27 12	2867	105 54 11	2877

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S					Sidereal Time of Semi-diameter Passing Meridian.	Equation of Time, to be Added to Apparent Time.	Diff. for 1 Hour.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Semi-diameter.			
		h m s	s	° ′ ″	″	′ ″	s	m s	s
Mon.	1	22 47 13.97	9.368	S. 7 42 46.3	+56.88	16 10.09	65.43	12 36.25	0.486
Tues.	2	22 50 58.57	9.347	7 19 58.0	57.15	16 9.86	65.36	12 24.33	0.507
Wed.	3	22 54 42.65	9.326	6 57 3.6	57.39	16 9.62	65.29	12 11.90	0.528
Thur.	4	22 58 26.24	9.306	6 34 3.3	+57.62	16 9.38	65.22	11 58.97	0.548
Frid.	5	23 2 9.36	9.287	6 10 57.7	57.84	16 9.13	65.15	11 45.57	0.567
Sat.	6	23 5 52.04	9.269	5 47 46.9	58.05	16 8.88	65.09	11 31.73	0.585
SUN.	7	23 9 34.29	9.252	5 24 31.5	+58.23	16 8.62	65.03	11 17.47	0.602
Mon.	8	23 13 16.15	9.236	5 1 11.9	58.40	16 8.36	64.97	11 2.81	0.619
Tues.	9	23 16 57.62	9.221	4 37 48.4	58.56	16 8.10	64.91	10 47.78	0.634
Wed.	10	23 20 38.74	9.206	4 14 21.3	+58.70	16 7.84	64.86	10 32.39	0.648
Thur.	11	23 24 19.53	9.192	3 50 50.9	58.83	16 7.57	64.81	10 16.67	0.661
Frid.	12	23 28 0.01	9.180	3 27 17.8	58.94	16 7.31	64.76	10 0.64	0.674
Sat.	13	23 31 40.19	9.169	3 3 42.2	+59.04	16 7.04	64.72	9 44.32	0.686
SUN.	14	23 35 20.11	9.158	2 40 4.3	59.12	16 6.77	64.68	9 27.73	0.696
Mon.	15	23 38 59.79	9.149	2 16 24.6	59.18	16 6.50	64.64	9 10.90	0.706
Tues.	16	23 42 39.25	9.140	1 52 43.7	+59.23	16 6.23	64.61	8 53.85	0.715
Wed.	17	23 46 18.50	9.132	1 29 1.7	59.26	16 5.95	64.57	8 36.59	0.723
Thur.	18	23 49 57.56	9.124	1 5 19.0	59.28	16 5.67	64.54	8 19.14	0.731
Frid.	19	23 53 36.45	9.117	0 41 36.0	+59.29	16 5.39	64.52	8 1.53	0.737
Sat.	20	23 57 15.19	9.111	S. 0 17 53.0	59.28	16 5.11	64.50	7 43.77	0.743
SUN.	21	0 0 53.80	9.106	N. 0 5 49.5	59.25	16 4.84	64.48	7 25.87	0.748
Mon.	22	0 4 32.29	9.102	0 29 31.2	+59.21	16 4.56	64.47	7 7.86	0.753
Tues.	23	0 8 10.68	9.098	0 53 11.6	59.15	16 4.29	64.45	6 49.75	0.757
Wed.	24	0 11 48.99	9.095	1 16 50.3	59.07	16 4.01	64.45	6 31.55	0.760
Thur.	25	0 15 27.22	9.092	1 40 27.0	+58.98	16 3.74	64.44	6 13.28	0.762
Frid.	26	0 19 5.40	9.090	2 4 1.3	58.87	16 3.47	64.43	5 54.96	0.764
Sat.	27	0 22 43.55	9.089	2 27 32.8	58.75	16 3.20	64.43	5 36.60	0.765
SUN.	28	0 26 21.68	9.089	2 51 1.2	+58.61	16 2.93	64.44	5 18.23	0.765
Mon.	29	0 29 59.81	9.090	3 14 26.2	58.45	16 2.66	64.44	4 59.86	0.765
Tues.	30	0 33 37.97	9.091	3 37 47.2	58.28	16 2.39	64.45	4 41.52	0.763
Wed.	31	0 37 16.18	9.093	4 1 3.9	58.10	16 2.12	64.46	4 23.22	0.761
Thur.	32	0 40 54.47	9.096	N. 4 24 16.1	+57.91	16 1.84	64.48	4 5.00	0.758

NOTE.—The mean time of semidiameter passing the meridian **may be found by subtracting** $0^{s}.18$ **from the sidereal time.**

The sign + prefixed to the hourly change of declination indicates that south **declinations are decreasing**; north declinations increasing.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Equation of Time, to be Subtracted from Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		h m s	s	° ′ ″	″	m s	s	h m s
Mon.	1	22 47 12.00	9.370	S. 7 42 58.3	+ 56.89	12 36.34	0.486	22 34 35.65
Tues.	2	22 50 56.63	9.349	7 20 9.8	57.15	12 24.43	0.507	22 38 32.20
Wed.	3	22 54 40.75	9.328	6 57 15.2	57.40	12 12.00	0.528	22 42 28.75
Thur.	4	22 58 24.38	9.308	6 34 14.8	+ 57.63	11 59.07	0.548	22 46 25.31
Frid.	5	23 2 7.54	9.289	6 11 9.0	57.85	11 45.68	0.567	22 50 21.86
Sat.	6	23 5 50.26	9.271	5 47 58.0	58.05	11 31.85	0.585	22 54 18.41
SUN.	7	23 9 32.55	9.254	5 24 42.5	+ 58.24	11 17.58	0.602	22 58 14.97
Mon.	8	23 13 14.45	9.238	5 1 22.7	58.41	11 2.93	0.619	23 2 11.52
Tues.	9	23 16 55.96	9.222	4 37 58.9	58.57	10 47.89	0.634	23 6 8.07
Wed.	10	23 20 37.12	9.208	4 14 31.5	+ 58.71	10 32.50	0.648	23 10 4.62
Thur.	11	23 24 17.96	9.195	3 51 1.0	58.83	10 16.78	0.661	23 14 1.18
Frid.	12	23 27 58.48	9.183	3 27 27.6	58.94	10 0.75	0.674	23 17 57.73
Sat.	13	23 31 38.71	9.171	3 3 51.7	+ 59.04	9 44.43	0.686	23 21 54.28
SUN.	14	23 35 18.67	9.160	2 40 13.6	59.12	9 27.84	0.696	23 25 50.83
Mon.	15	23 38 58.39	9.150	2 16 33.7	59.19	9 11.00	0.706	23 29 47.39
Tues.	16	23 42 37.89	9.141	1 52 52.5	+ 59.24	8 53.95	0.715	23 33 43.94
Wed.	17	23 46 17.18	9.133	1 29 10.2	59.28	8 36.68	0.723	23 37 40.50
Thur.	18	23 49 56.29	9.126	1 5 27.2	59.30	8 19.24	0.731	23 41 37.05
Frid.	19	23 53 35.23	9.119	0 41 43.8	+ 59.30	8 1.63	0.737	23 45 33.60
Sat.	20	23 57 14.02	9.113	S. 0 18 0.6	59.29	7 43.87	0.743	23 49 30.15
SUN.	21	0 0 52.68	9.108	N. 0 5 42.2	59.27	7 25.97	0.748	23 53 26.71
Mon.	22	0 4 31.22	9.103	0 29 24.2	+ 59.22	7 7.96	0.753	23 57 23.26
Tues.	23	0 8 9.65	9.099	0 53 4.9	59.16	6 49.84	0.757	0 1 19.81
Wed.	24	0 11 48.00	9.096	1 16 43.9	59.08	6 31.63	0.760	0 5 16.37
Thur.	25	0 15 26.28	9.094	1 40 20.9	+ 58.99	6 13.36	0.762	0 9 12.92
Frid.	26	0 19 4.50	9.092	2 3 55.5	58.88	5 55.03	0.764	0 13 9.47
Sat.	27	0 22 42.69	9.091	2 27 27.3	58.76	5 36.66	0.765	0 17 6.03
SUN.	28	0 26 20.87	9.091	2 50 56.0	+ 58.63	5 18.29	0.765	0 21 2.58
Mon.	29	0 29 59.05	9.092	3 14 21.3	58.48	4 59.92	0.765	0 24 59.13
Tues.	30	0 33 37.26	9.093	3 37 42.6	58.31	4 41.58	0.763	0 28 55.68
Wed.	31	0 37 15.52	9.095	4 0 59.7	58.12	4 23.28	0.761	0 32 52.24
Thur.	32	0 40 53.84	9.099	N. 4 24 12.2	+ 57.93	4 5.05	0.758	0 36 48.79

Note.—The semidiameter for mean noon may be assumed the same as that for apparent noon. The sign + prefixed to the hourly change of declination indicates that south declinations are decreasing; north declinations increasing.

Diff. for 1 Hour,
+9ˢ.8565.
(Table III.)

AT GREENWICH MEAN NOON.

Day of the Month.	Day of the Year.	THE SUN'S				Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.
		TRUE LONGITUDE.		Diff. for 1 Hour.	LATITUDE.			
		λ	λ′					
		° ′ ″	′ ″	″	″			h m s
1	60	340 17 19.3	17 27.2	150.45	+ 0.05	9.996 1346	+ 44.0	1 25 10.36
2	61	341 17 29.1	17 36.9	150.37	0.18	9.996 2410	44.6	1 21 14.46
3	62	342 17 36.9	17 44.6	150.28	0.28	9.996 3489	45.2	1 17 18.55
4	63	343 17 42.8	17 50.3	150.20	+ 0.38	9.996 4582	+ 45.8	1 13 22.64
5	64	344 17 46.6	17 54.0	150.12	0.44	9.996 5690	46.5	1 9 26.74
6	65	345 17 48.5	17 55.8	150.04	0.49	9.996 6812	47.1	1 5 30.83
7	66	346 17 48.4	17 55.7	149.96	+ 0.51	9.996 7950	+ 47.7	1 1 34.92
8	67	347 17 46.6	17 53.8	149.88	0.49	9.996 9102	48.3	0 57 39.01
9	68	348 17 42.8	17 49.9	149.80	0.46	9.997 0268	48.9	0 53 43.11
10	69	349 17 37.2	17 44.2	149.73	+ 0.40	9.997 1447	+ 49.4	0 49 47.20
11	70	350 17 29.9	17 36.8	149.66	0.32	9.997 2638	49.9	0 45 51.29
12	71	351 17 20.8	17 27.6	149.59	0.23	9.997 3841	50.3	0 41 55.38
13	72	352 17 10.0	17 16.7	149.51	+ 0.12	9.997 5054	+ 50.7	0 37 59.48
14	73	353 16 57.5	17 4.1	149.44	0.00	9.997 6276	51.1	0 34 3.57
15	74	354 16 43.3	16 49.8	149.37	— 0.13	9.997 7506	51.3	0 30 7.66
16	75	355 16 27.4	16 33.8	149.30	— 0.25	9.997 8740	+ 51.5	0 26 11.76
17	76	356 16 9.8	16 16.1	149.23	0.36	9.997 9979	51.6	0 22 15.85
18	77	357 15 50.5	15 56.7	149.16	0.45	9.998 1220	51.7	0 18 19.94
19	78	358 15 29.4	15 35.5	149.09	— 0.50	9.998 2461	+ 51.7	0 14 24.04
20	79	359 15 6.5	15 12.5	149.01	0.53	9.998 3701	51.6	0 10 28.13
21	80	0 14 41.7	14 47.6	148.93	0.52	9.998 4938	51.5	0 6 32.22
22	81	1 14 14.8	14 20.6	148.84	— 0.50	9.998 6173	+ 51.4	0 2 36.31 23 58 40.41
23	82	2 13 45.9	13 51.6	148.75	0.42	9.998 7404	51.3	23 54 44.50
24	83	3 13 14.8	13 20.3	148.66	0.34	9.998 8632	51.2	23 50 48.59
25	84	4 12 41.4	12 47.0	148.57	— 0.23	9.998 9857	+ 51.1	23 46 52.68
26	85	5 12 5.8	12 11.2	148.47	— 0.10	9.999 1081	51.0	23 42 56.78
27	86	6 11 27.9	11 33.2	148.37	+ 0.04	9.999 2304	51.0	23 39 0.87
28	87	7 10 47.6	10 52.8	148.27	+ 0.18	9.999 3526	+ 51.0	23 35 4.96
29	88	8 10 4.9	10 10.0	148.17	0.31	9.999 4750	51.0	23 31 9.05
30	89	9 9 20.0	9 25.0	148.08	0.43	9.999 5976	51.1	23 27 13.15
31	90	10 8 32.7	8 37.7	147.98	0.52	9.999 7204	51.2	23 23 17.24
32	91	11 7 43.2	7 48.0	147.89	+ 0.58	9.999 8435	+ 51.4	23 19 21.33

NOTE.—The numbers in column λ correspond to the true equinox of the date; in column λ′ to the mean equinox of January $0^d.0$.

Diff. for 1 Hour, — $9^s.8296$. (Table II.)

GREENWICH MEAN TIME.

THE MOON'S

Day of the Month.	SEMIDIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
	′ ″	′ ″	′ ″	″	′ ″	″	h m	m	d
1	15 9.7	15 5.1	55 32.6	− 1.48	55 15.8	− 1.33	8 19.3	2.18	9.0
2	15 1.0	14 57.4	55 0.7	1.18	54 47.4	1.04	9 10.7	2.11	10.0
3	14 54.2	14 51.5	54 35.8	0.90	54 25.8	0.77	10 0.2	2.01	11.0
4	14 49.2	14 47.3	54 17.4	− 0.64	54 10.5	− 0.52	10 47.3	1.91	12.0
5	14 45.8	14 44.7	54 4.9	0.40	54 0.8	0.29	11 32.0	1.82	13.0
6	14 44.0	14 43.6	53 58.0	− 0.18	53 56.5	− 0.07	12 14.7	1.74	14.0
7	14 43.5	14 43.8	53 56.2	+ 0.03	53 57.3	+ 0.14	12 55.8	1.69	15.0
8	14 44.4	14 45.4	53 59.7	0.25	54 3.5	0.37	13 36.2	1.68	16.0
9	14 46.9	14 48.7	54 8.7	0.49	54 15.4	0.62	14 16.7	1.70	17.0
10	14 50.9	14 53.6	54 23.6	+ 0.76	54 33.5	+ 0.90	14 58.2	1.76	18.0
11	14 56.8	15 0.5	54 45.2	1.04	54 58.6	1.20	15 41.6	1.86	19.0
12	15 4.6	15 9.3	55 13.9	1.35	55 31.0	1.50	16 27.7	1.99	20.0
13	15 14.5	15 20.1	55 50.0	+ 1.66	56 10.9	+ 1.81	17 17.2	2.14	21.0
14	15 26.3	15 32.9	56 33.5	1.95	56 57.7	2.08	18 10.5	2.30	22.0
15	15 39.9	15 47.2	57 23.3	2.18	57 50.0	2.25	19 7.3	2.42	23.0
16	15 54.6	16 2.1	58 17.4	+ 2.30	58 45.1	+ 2.30	20 6.4	2.49	24.0
17	16 9.6	16 16.8	59 12.5	2.25	59 39.1	2.14	21 6.2	2.48	25.0
18	16 23.6	16 29.8	60 4.1	1.99	60 26.8	1.77	22 5.1	2.42	26.0
19	16 35.2	16 39.6	60 46.6	+ 1.50	61 2.8	+ 1.17	23 2.2	2.34	27.0
20	16 42.9	16 44.9	61 14.8	+ 0.80	61 22.0	+ 0.40	23 57.3	2.26	28.0
21	16 45.5	16 44.7	61 24.2	− 0.02	61 21.4	− 0.45	☌	. . .	29.0
22	16 42.6	16 39.2	61 13.6	− 0.85	61 0.9	− 1.24	0 50.9	2.21	0.7
23	16 34.5	16 28.8	60 43.8	1.58	60 23.0	1.86	1 43.8	2.20	1.7
24	16 22.3	16 15.1	59 59.1	2.09	59 32.8	2.26	2 36.8	2.22	2.7
25	16 7.5	15 59.6	59 4.8	− 2.37	58 35.8	− 2.42	3 30.3	2.25	3.7
26	15 51.6	15 43.8	58 6.6	2.42	57 37.7	2.38	4 24.7	2.28	4.7
27	15 36.1	15 28.8	57 9.6	2.29	56 42.8	2.17	5 19.4	2.28	5.7
28	15 21.9	15 15.6	56 17.6	− 2.03	55 54.2	− 1.86	6 13.7	2.24	6.7
29	15 9.7	15 4.5	55 32.8	1.69	55 13.6	1.50	7 6.6	2.16	7.7
30	14 59.9	14 55.9	54 56.7	1.32	54 42.0	1.13	7 57.2	2.05	8.7
31	14 52.6	14 49.8	54 29.6	0.94	54 19.4	0.76	8 45.1	1.94	9.7
32	14 47.6	14 45.9	54 11.2	− 0.59	54 5.1	− 0.43	9 30.4	1.84	10.7

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
MONDAY 1.					WEDNESDAY 3.				
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	6 36 18.58	2.2789	N.24 32 30.8	0.682	0	8 23 1.99	2.1500	N.22 43 10.7	5.047
1	6 38 35.27	2.2774	24 33 7.9	0.553	1	8 25 10.88	2.1464	22 38 4.7	5.153
2	6 40 51.87	2.2759	24 33 37.2	0.424	2	8 27 19.56	2.1427	22 32 52.3	5.258
3	6 43 8.38	2.2743	24 33 58.8	0.295	3	8 29 28.01	2.1390	22 27 33.7	5.362
4	6 45 24.79	2.2727	24 34 12.6	0.167	4	8 31 36.24	2.1352	22 22 8.9	5.465
5	6 47 41.10	2.2710	24 34 18.8	+0.039	5	8 33 44.24	2.1315	22 16 37.9	5.568
6	6 49 57.31	2.2692	24 34 17.3	−0.088	6	8 35 52.02	2.1278	22 11 0.7	5.671
7	6 52 13.41	2.2673	24 34 8.2	0.216	7	8 37 59.57	2.1240	22 5 17.4	5.772
8	6 54 29.39	2.2655	24 33 51.4	0.343	8	8 40 6.90	2.1202	21 59 28.1	5.872
9	6 56 45.26	2.2635	24 33 27.0	0.470	9	8 42 14.00	2.1164	21 53 32.8	5.972
10	6 59 1.01	2.2615	24 32 55.0	0.597	10	8 44 20.87	2.1126	21 47 31.5	6.071
11	7 1 16.64	2.2595	24 32 15.4	0.723	11	8 46 27.51	2.1087	21 41 24.3	6.169
12	7 3 32.15	2.2574	24 31 28.2	0.849	12	8 48 33.92	2.1049	21 35 11.2	6.267
13	7 5 47.53	2.2552	24 30 33.5	0.974	13	8 50 40.10	2.1010	21 28 52.3	6.363
14	7 8 2.77	2.2529	24 29 31.3	1.098	14	8 52 46.04	2.0971	21 22 27.6	6.459
15	7 10 17.88	2.2507	24 28 21.7	1.222	15	8 54 51.75	2.0932	21 15 57.2	6.554
16	7 12 32.86	2.2484	24 27 4.6	1.347	16	8 56 57.23	2.0894	21 9 21.1	6.649
17	7 14 47.69	2.2460	24 25 40.0	1.472	17	8 59 2.48	2.0855	21 2 39.3	6.743
18	7 17 2.38	2.2436	24 24 8.0	1.595	18	9 1 7.49	2.0816	20 55 51.9	6.836
19	7 19 16.92	2.2411	24 22 28.6	1.717	19	9 3 12.27	2.0777	20 48 59.0	6.928
20	7 21 31.31	2.2386	24 20 41.9	1.840	20	9 5 16.82	2.0738	20 42 0.5	7.020
21	7 23 45.55	2.2360	24 18 47.8	1.962	21	9 7 21.13	2.0698	20 34 56.6	7.110
22	7 25 59.63	2.2333	24 16 46.4	2.084	22	9 9 25.20	2.0659	20 27 47.3	7.200
23	7 28 13.55	2.2307	N.24 14 37.7	2.205	23	9 11 29.04	2.0621	N.20 20 32.6	7.290
TUESDAY 2					THURSDAY 4.				
0	7 30 27.31	2.2279	N.24 12 21.8	2.326	0	9 13 32.65	2.0582	N.20 13 12.5	7.378
1	7 32 40.90	2.2252	24 9 58.6	2.446	1	9 15 36.02	2.0542	20 5 47.2	7.466
2	7 34 54.33	2.2223	24 7 28.3	2.565	2	9 17 39.16	2.0503	19 58 16.6	7.552
3	7 37 7.58	2.2194	24 4 50.8	2.684	3	9 19 42.06	2.0464	19 50 40.9	7.638
4	7 39 20.66	2.2165	24 2 6.2	2.802	4	9 21 44.73	2.0425	19 43 0.0	7.723
5	7 41 33.56	2.2135	23 59 14.5	2.921	5	9 23 47.16	2.0386	19 35 14.1	7.807
6	7 43 46.28	2.2105	23 56 15.7	3.038	6	9 25 49.36	2.0347	19 27 23.1	7.892
7	7 45 58.82	2.2075	23 53 9.9	3.155	7	9 27 51.33	2.0308	19 19 27.1	7.975
8	7 48 11.18	2.2044	23 49 57.1	3.271	8	9 29 53.06	2.0269	19 11 26.1	8.057
9	7 50 23.35	2.2012	23 46 37.4	3.387	9	9 31 54.56	2.0231	19 3 20.3	8.137
10	7 52 35.33	2.1981	23 43 10.7	3.502	10	9 33 55.83	2.0192	18 55 9.6	8.218
11	7 54 47.12	2.1949	23 39 37.1	3.617	11	9 35 56.86	2.0153	18 46 54.1	8.298
12	7 56 58.72	2.1917	23 35 56.7	3.730	12	9 37 57.67	2.0116	18 38 33.8	8.377
13	7 59 10.12	2.1883	23 32 9.5	3.843	13	9 39 58.25	2.0077	18 30 8.8	8.455
14	8 1 21.32	2.1850	23 28 15.5	3.957	14	9 41 58.60	2.0039	18 21 39.2	8.532
15	8 3 32.32	2.1817	23 24 14.7	4.069	15	9 43 58.72	2.0001	18 13 4.9	8.609
16	8 5 43.12	2.1783	23 20 7.2	4.180	16	9 45 58.61	1.9963	18 4 26.1	8.685
17	8 7 53.72	2.1749	23 15 53.1	4.290	17	9 47 58.28	1.9926	17 55 42.7	8.760
18	8 10 4.11	2.1713	23 11 32.4	4.401	18	9 49 57.72	1.9888	17 46 54.9	8.833
19	8 12 14.28	2.1678	23 7 5.0	4.511	19	9 51 56.94	1.9852	17 38 2.7	8.907
20	8 14 24.25	2.1644	23 2 31.1	4.620	20	9 53 55.94	1.9814	17 29 6.1	8.979
21	8 16 34.01	2.1608	22 57 50.6	4.728	21	9 55 54.71	1.9777	17 20 5.2	9.051
22	8 18 43.55	2.1572	22 53 3.7	4.835	22	9 57 53.27	1.9741	17 11 0.0	9.122
23	8 20 52.88	2.1537	22 48 10.4	4.942	23	9 59 51.60	1.9704	17 1 50.5	9.192
24	8 23 1.99	2.1500	N.22 43 10.7	5.047	24	10 1 49.72	1.9668	N.16 52 36.9	9.262

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	FRIDAY 5.					SUNDAY 7.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	10 1 49.72	1.9668	N.16 52 36.9	9.262	0	11 32 38.66	1.8316	N. 8 23 3.1	11.677
1	10 3 47.62	1.9632	16 43 19.1	9.330	1	11 34 28.50	1.8297	8 11 21.6	11.708
2	10 5 45.31	1.9597	16 33 57.3	9.397	2	11 36 18.23	1.8280	7 59 38.2	11.738
3	10 7 42.78	1.9561	16 24 31.4	9.465	3	11 38 7.86	1.8262	7 47 53.0	11.768
4	10 9 40.04	1.9526	16 15 1.5	9.531	4	11 39 57.38	1.8246	7 36 6.0	11.798
5	10 11 37.09	1.9491	16 5 27.7	9.596	5	11 41 46.81	1.8231	7 24 17.2	11.827
6	10 13 33.93	1.9456	15 55 50.0	9.661	6	11 43 36.15	1.8215	7 12 26.7	11.855
7	10 15 30.56	1.9421	15 46 8.4	9.725	7	11 45 25.39	1.8199	7 0 34.6	11.882
8	10 17 26.98	1.9387	15 36 23.0	9.787	8	11 47 14.54	1.8185	6 48 40.8	11.910
9	10 19 23.20	1.9353	15 26 33.9	9.850	9	11 49 3.61	1.8171	6 36 45.4	11.936
10	10 21 19.22	1.9320	15 16 41.0	9.912	10	11 50 52.59	1.8157	6 24 48.5	11.962
11	10 23 15.04	1.9287	15 6 44.5	9.972	11	11 52 41.49	1.8143	6 12 50.0	11.987
12	10 25 10.66	1.9253	14 56 44.4	10.032	12	11 54 30.31	1.8131	6 0 50.1	12.010
13	10 27 6.08	1.9221	14 46 40.7	10.091	13	11 56 19.06	1.8119	5 48 48.8	12.033
14	10 29 1.31	1.9189	14 36 33.5	10.149	14	11 58 7.74	1.8107	5 36 46.1	12.056
15	10 30 56.35	1.9157	14 26 22.8	10.207	15	11 59 56.35	1.8097	5 24 42.1	12.077
16	10 32 51.19	1.9124	14 16 8.7	10.263	16	12 1 44.90	1.8086	5 12 36.8	12.098
17	10 34 45.84	1.9093	14 5 51.2	10.319	17	12 3 33.38	1.8075	5 0 30.3	12.118
18	10 36 40.31	1.9062	13 55 30.4	10.374	18	12 5 21.80	1.8066	4 48 22.6	12.138
19	10 38 34.59	1.9032	13 45 6.3	10.429	19	12 7 10.17	1.8057	4 36 13.7	12.157
20	10 40 28.69	1.9002	13 34 38.9	10.482	20	12 8 58.48	1.8048	4 24 3.7	12.176
21	10 42 22.61	1.8972	13 24 8.4	10.535	21	12 10 46.74	1.8041	4 11 52.6	12.193
22	10 44 16.35	1.8942	13 13 34.7	10.587	22	12 12 34.96	1.8033	3 59 40.5	12.210
23	10 46 9.91	1.8912	N.13 2 57.9	10.639	23	12 14 23.14	1.8026	N. 3 47 27.4	12.227
	SATURDAY 6.					MONDAY 8.			
0	10 48 3.30	1.8884	N.12 52 18.0	10.690	0	12 16 11.28	1.8020	N. 3 35 13.3	12.242
1	10 49 56.52	1.8855	12 41 35.1	10.739	1	12 17 59.38	1.8014	3 22 58.3	12.257
2	10 51 49.56	1.8827	12 30 49.3	10.787	2	12 19 47.45	1.8009	3 10 42.5	12.270
3	10 53 42.44	1.8800	12 20 0.6	10.837	3	12 21 35.49	1.8004	2 58 25.9	12.283
4	10 55 35.16	1.8772	12 9 9.0	10.884	4	12 23 23.50	1.7999	2 46 8.5	12.297
5	10 57 27.71	1.8745	11 58 14.5	10.931	5	12 25 11.48	1.7995	2 33 50.3	12.308
6	10 59 20.10	1.8719	11 47 17.2	10.977	6	12 26 59.44	1.7992	2 21 31.5	12.319
7	11 1 12.34	1.8693	11 36 17.3	11.022	7	12 28 47.39	1.7990	2 9 12.0	12.330
8	11 3 4.42	1.8667	11 25 14.6	11.067	8	12 30 35.33	1.7988	1 56 51.9	12.340
9	11 4 56.34	1.8642	11 14 9.3	11.110	9	12 32 23.25	1.7987	1 44 31.2	12.349
10	11 6 48.12	1.8617	11 3 1.4	11.152	10	12 34 11.17	1.7986	1 32 10.0	12.357
11	11 8 39.75	1.8592	10 51 50.9	11.195	11	12 35 59.08	1.7985	1 19 48.3	12.365
12	11 10 31.23	1.8568	10 40 37.9	11.237	12	12 37 46.99	1.7985	1 7 26.2	12.372
13	11 12 22.57	1.8545	10 29 22.5	11.277	13	12 39 34.90	1.7986	0 55 3.7	12.378
14	11 14 13.77	1.8522	10 18 4.7	11.317	14	12 41 22.82	1.7987	0 42 40.8	12.384
15	11 16 4.83	1.8499	10 6 44.5	11.357	15	12 43 10.75	1.7989	0 30 17.6	12.389
16	11 17 55.76	1.8477	9 55 21.9	11.395	16	12 44 58.69	1.7992	0 17 54.1	12.393
17	11 19 46.56	1.8455	9 43 57.1	11.432	17	12 46 46.65	1.7994	N. 0 5 30.4	12.397
18	11 21 37.23	1.8433	9 32 30.1	11.469	18	12 48 34.62	1.7997	S. 0 6 53.5	12.399
19	11 23 27.77	1.8413	9 21 0.8	11.506	19	12 50 22.62	1.8002	0 19 17.5	12.402
20	11 25 18.18	1.8392	9 9 29.4	11.542	20	12 52 10.65	1.8007	0 31 41.7	12.403
21	11 27 8.47	1.8372	8 57 55.9	11.576	21	12 53 58.70	1.8012	0 44 5.9	12.403
22	11 28 58.65	1.8353	8 46 20.3	11.609	22	12 55 46.79	1.8017	0 56 30.1	12.403
23	11 30 48.71	1.8334	8 34 42.7	11.643	23	12 57 34.91	1.8023	1 8 54.3	12.403
24	11 32 38.66	1.8316	N. 8 23 3.1	11.677	24	12 59 23.07	1.8031	S. 1 21 18.4	12.402

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	TUESDAY 9.					THURSDAY 11.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	12 59 23.07	1.8031	S. 1 21 18.4	12.402	0	14 27 49.65	1.9046	S. 11 1 14.3	11.473
1	13 1 11.28	1.8038	1 33 42.5	12.399	1	14 29 44.03	1.9081	11 12 41.6	11.435
2	13 2 59.53	1.8046	1 46 6.4	12.397	2	14 31 38.62	1.9116	11 24 6.5	11.396
3	13 4 47.83	1.8054	1 58 30.1	12.393	3	14 33 33.42	1.9152	11 35 29.1	11.356
4	13 6 36.18	1.8063	2 10 53.6	12.389	4	14 35 28.45	1.9190	11 46 49.2	11.314
5	13 8 24.59	1.8074	2 23 16.8	12.384	5	14 37 23.70	1.9227	11 58 6.8	11.273
6	13 10 13.06	1.8084	2 35 39.7	12.378	6	14 39 19.18	1.9266	12 9 21.9	11.231
7	13 12 1.60	1.8094	2 48 2.2	12.372	7	14 41 14.89	1.9305	12 20 34.5	11.187
8	13 13 50.21	1.8107	3 0 24.3	12.365	8	14 43 10.84	1.9344	12 31 44.4	11.142
9	13 15 38.89	1.8119	3 12 46.0	12.357	9	14 45 7.02	1.9383	12 42 51.6	11.097
10	13 17 27.64	1.8131	3 25 7.2	12.349	10	14 47 3.44	1.9424	12 53 56.0	11.051
11	13 19 16.46	1.8144	3 37 27.9	12.340	11	14 49 0.11	1.9465	13 4 57.7	11.004
12	13 21 5.36	1.8158	3 49 48.0	12.330	12	14 50 57.02	1.9506	13 15 56.5	10.956
13	13 22 54.35	1.8173	4 2 7.5	12.319	13	14 52 54.18	1.9548	13 26 52.4	10.907
14	13 24 43.43	1.8188	4 14 26.3	12.307	14	14 54 51.60	1.9592	13 37 45.4	10.857
15	13 26 32.60	1.8203	4 26 44.4	12.295	15	14 56 49.28	1.9634	13 48 35.3	10.807
16	13 28 21.87	1.8219	4 39 1.7	12.282	16	14 58 47.21	1.9677	13 59 22.2	10.756
17	13 30 11.24	1.8236	4 51 18.3	12.269	17	15 0 45.41	1.9722	14 10 6.0	10.703
18	13 32 0.71	1.8253	5 3 34.0	12.255	18	15 2 43.87	1.9767	14 20 46.6	10.650
19	13 33 50.28	1.8271	5 15 48.9	12.240	19	15 4 42.61	1.9812	14 31 24.0	10.596
20	13 35 39.96	1.8290	5 28 2.8	12.223	20	15 6 41.62	1.9857	14 41 58.1	10.540
21	13 37 29.76	1.8309	5 40 15.7	12.207	21	15 8 40.90	1.9903	14 52 28.8	10.484
22	13 39 19.67	1.8328	5 52 27.7	12.191	22	15 10 40.46	1.9950	15 2 56.2	10.427
23	13 41 9.70	1.8348	S. 6 4 38.6	12.172	23	15 12 40.30	1.9997	S. 15 13 20.1	10.369
	WEDNESDAY 10.					FRIDAY 12.			
0	13 42 59.85	1.8369	S. 6 16 48.4	12.153	0	15 14 40.42	2.0044	S. 15 23 40.5	10.310
1	13 44 50.13	1.8391	6 28 57.0	12.134	1	15 16 40.83	2.0093	15 33 57.3	10.250
2	13 46 40.54	1.8412	6 41 4.5	12.114	2	15 18 41.54	2.0142	15 44 10.5	10.189
3	13 48 31.08	1.8435	6 53 10.7	12.092	3	15 20 42.53	2.0190	15 54 20.0	10.127
4	13 50 21.76	1.8458	7 5 15.6	12.071	4	15 22 43.82	2.0240	16 4 25.8	10.065
5	13 52 12.58	1.8482	7 17 19.2	12.049	5	15 24 45.41	2.0290	16 14 27.8	10.001
6	13 54 3.55	1.8507	7 29 21.4	12.026	6	15 26 47.30	2.0341	16 24 25.9	9.936
7	13 55 54.67	1.8532	7 41 22.2	12.002	7	15 28 49.50	2.0392	16 34 20.1	9.870
8	13 57 45.93	1.8557	7 53 21.6	11.977	8	15 30 52.00	2.0442	16 44 10.3	9.802
9	13 59 37.35	1.8583	8 5 19.5	11.951	9	15 32 54.81	2.0494	16 53 56.4	9.735
10	14 1 28.93	1.8610	8 17 15.8	11.925	10	15 34 57.93	2.0546	17 3 38.5	9.667
11	14 3 20.67	1.8637	8 29 10.5	11.898	11	15 37 1.36	2.0598	17 13 16.4	9.597
12	14 5 12.58	1.8665	8 41 3.6	11.871	12	15 39 5.11	2.0652	17 22 50.1	9.526
13	14 7 4.65	1.8693	8 52 55.0	11.842	13	15 41 9.18	2.0705	17 32 19.5	9.453
14	14 8 56.90	1.8723	9 4 44.6	11.812	14	15 43 13.57	2.0758	17 41 44.5	9.380
15	14 10 49.33	1.8752	9 16 32.4	11.782	15	15 45 18.28	2.0812	17 51 5.1	9.307
16	14 12 41.93	1.8782	9 28 18.4	11.751	16	15 47 23.32	2.0867	18 0 21.3	9.232
17	14 14 34.72	1.8813	9 40 2.5	11.718	17	15 49 28.69	2.0922	18 9 33.0	9.156
18	14 16 27.69	1.8845	9 51 44.6	11.686	18	15 51 34.38	2.0977	18 18 40.1	9.078
19	14 18 20.86	1.8877	10 3 24.8	11.653	19	15 53 40.41	2.1032	18 27 42.5	9.000
20	14 20 14.22	1.8909	10 15 3.0	11.619	20	15 55 46.77	2.1088	18 36 40.1	8.921
21	14 22 7.77	1.8943	10 26 39.1	11.583	21	15 57 53.47	2.1144	18 45 32.9	8.842
22	14 24 1.52	1.8976	10 38 13.0	11.547	22	16 0 0.50	2.1201	18 54 20.9	8.760
23	14 25 55.48	1.9010	10 49 44.8	11.511	23	16 2 7.88	2.1257	19 3 4.1	8.677
24	14 27 49.65	1.9046	S. 11 1 14.3	11.473	24	16 4 15.59	2.1314	S. 19 11 42.3	8.594

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	SATURDAY 13.					MONDAY 15.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	16 4 15.59	2.1314	S. 19 11 42.3	8.594	0	17 53 18.65	2.4081	S. 24 6 41.1	3.266
1	16 6 23.65	2.1372	19 20 15.4	8.509	1	17 55 43.29	2.4132	24 9 52.9	3.128
2	16 8 32.05	2.1428	19 28 43.4	8.423	2	17 58 8.23	2.4182	24 12 56.4	2.989
3	16 10 40.79	2.1487	19 37 6.2	8.337	3	18 0 33.47	2.4231	24 15 51.6	2.849
4	16 12 49.89	2.1545	19 45 23.8	8.249	4	18 2 59.00	2.4280	24 18 38.3	2.708
5	16 14 59.33	2.1602	19 53 36.1	8.160	5	18 5 24.83	2.4329	24 21 16.6	2.566
6	16 17 9.12	2.1661	20 1 43.0	8.070	6	18 7 50.95	2.4377	24 23 46.3	2.423
7	16 19 19.26	2.1719	20 9 44.5	7.978	7	18 10 17.36	2.4424	24 26 7.4	2.280
8	16 21 29.75	2.1778	20 17 40.4	7.886	8	18 12 44.04	2.4470	24 28 19.9	2.136
9	16 23 40.60	2.1837	20 25 30.8	7.792	9	18 15 11.00	2.4516	24 30 23.7	1.990
10	16 25 51.80	2.1896	20 33 15.5	7.697	10	18 17 38.23	2.4561	24 32 18.7	1.843
11	16 28 3.35	2.1955	20 40 54.5	7.602	11	18 20 5.73	2.4605	24 34 4.9	1.697
12	16 30 15.26	2.2015	20 48 27.7	7.505	12	18 22 33.49	2.4648	24 35 42.3	1.549
13	16 32 27.53	2.2074	20 55 55.1	7.407	13	18 25 1.51	2.4691	24 37 10.8	1.400
14	16 34 40.15	2.2133	21 3 16.5	7.307	14	18 27 29.78	2.4732	24 38 30.3	1.250
15	16 36 53.13	2.2193	21 10 32.0	7.207	15	18 29 58.30	2.4774	24 39 40.8	1.099
16	16 39 6.47	2.2252	21 17 41.4	7.106	16	18 32 27.07	2.4814	24 40 42.2	0.947
17	16 41 20.16	2.2312	21 24 44.7	7.003	17	18 34 56.07	2.4852	24 41 34.5	0.795
18	16 43 34.21	2.2372	21 31 41.8	6.900	18	18 37 25.30	2.4891	24 42 17.7	0.643
19	16 45 48.62	2.2432	21 38 32.7	6.795	19	18 39 54.76	2.4928	24 42 51.7	0.490
20	16 48 3.39	2.2492	21 45 17.2	6.689	20	18 42 24.44	2.4965	24 43 16.5	0.336
21	16 50 18.52	2.2551	21 51 55.4	6.582	21	18 44 54.34	2.5000	24 43 32.0	0.180
22	16 52 34.00	2.2610	21 58 27.1	6.473	22	18 47 24.44	2.5034	24 43 38.1	−0.024
23	16 54 49.84	2.2670	S. 22 4 52.2	6.364	23	18 49 54.75	2.5068	S. 24 43 34.9	+0.132
	SUNDAY 14.					TUESDAY 16.			
0	16 57 6.04	2.2730	S. 22 11 10.8	6.254	0	18 52 25.26	2.5101	S. 24 43 22.3	0.288
1	16 59 22.60	2.2789	22 17 22.7	6.142	1	18 54 55.96	2.5132	24 43 0.3	0.446
2	17 1 39.51	2.2847	22 23 27.9	6.029	2	18 57 26.85	2.5163	24 42 28.8	0.604
3	17 3 56.77	2.2907	22 29 26.2	5.915	3	18 59 57.92	2.5193	24 41 47.8	0.762
4	17 6 14.39	2.2966	22 35 17.7	5.801	4	19 2 29.17	2.5222	24 40 57.3	0.922
5	17 8 32.36	2.3024	22 41 2.3	5.684	5	19 5 0.59	2.5250	24 39 57.2	1.082
6	17 10 50.68	2.3083	22 46 39.8	5.567	6	19 7 32.17	2.5276	24 38 47.5	1.242
7	17 13 9.36	2.3142	22 52 10.3	5.448	7	19 10 3.90	2.5302	24 37 28.2	1.402
8	17 15 28.38	2.3199	22 57 33.6	5.328	8	19 12 35.79	2.5327	24 35 59.2	1.563
9	17 17 47.75	2.3257	23 2 49.7	5.207	9	19 15 7.82	2.5350	24 34 20.6	1.725
10	17 20 7.46	2.3314	23 7 58.5	5.086	10	19 17 39.99	2.5372	24 32 32.2	1.887
11	17 22 27.52	2.3372	23 13 0.0	4.963	11	19 20 12.29	2.5393	24 30 34.2	2.048
12	17 24 47.92	2.3428	23 17 54.1	4.839	12	19 22 44.71	2.5413	24 28 26.4	2.211
13	17 27 8.66	2.3485	23 22 40.7	4.714	13	19 25 17.25	2.5433	24 26 8.9	2.373
14	17 29 29.74	2.3542	23 27 19.8	4.587	14	19 27 49.91	2.5452	24 23 41.6	2.537
15	17 31 51.16	2.3597	23 31 51.2	4.460	15	19 30 22.67	2.5468	24 21 4.5	2.700
16	17 34 12.91	2.3653	23 36 15.0	4.332	16	19 32 55.53	2.5484	24 18 17.6	2.863
17	17 36 35.00	2.3708	23 40 31.0	4.202	17	19 35 28.48	2.5499	24 15 20.9	3.027
18	17 38 57.41	2.3762	23 44 39.2	4.072	18	19 38 1.52	2.5512	24 12 14.4	3.191
19	17 41 20.15	2.3817	23 48 39.6	3.940	19	19 40 34.63	2.5525	24 8 58.0	3.355
20	17 43 43.22	2.3871	23 52 32.0	3.807	20	19 43 7.82	2.5537	24 5 31.8	3.518
21	17 46 6.60	2.3923	23 56 16.4	3.673	21	19 45 41.08	2.5547	24 1 55.8	3.682
22	17 48 30.30	2.3977	23 59 52.8	3.538	22	19 48 14.39	2.5557	23 58 9.9	3.847
23	17 50 54.32	2.4029	24 3 21.0	3.402	23	19 50 47.76	2.5566	23 54 14.2	4.011
24	17 53 18.65	2.4081	S. 24 6 41.1	3.266	24	19 53 21.18	2.5573	S. 23 50 8.6	4.175

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	WEDNESDAY 17.					FRIDAY 19.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	19 53 21.18	2.5573	S. 23 50 8.6	4.175	0	21 55 6.73	2.4862	S. 17 28 43.5	11.414
1	19 55 54.64	2.5579	23 45 53.2	4.339	1	21 57 35.81	2.4832	17 17 14.9	11.540
2	19 58 28.13	2.5583	23 41 27.9	4.503	2	22 0 4.71	2.4802	17 5 38.7	11.664
3	20 1 1.64	2.5587	23 36 52.8	4.667	3	22 2 33.43	2.4772	16 53 55.2	11.787
4	20 3 35.18	2.5591	23 32 7.9	4.830	4	22 5 1.97	2.4741	16 42 4.3	11.908
5	20 6 8.73	2.5592	23 27 13.2	4.993	5	22 7 30.32	2.4709	16 30 6.2	12.027
6	20 8 42.29	2.5593	23 22 8.7	5.157	6	22 9 58.48	2.4677	16 18 1.0	12.146
7	20 11 15.85	2.5593	23 16 54.4	5.320	7	22 12 26.45	2.4646	16 5 48.7	12.263
8	20 13 49.41	2.5592	23 11 30.3	5.482	8	22 14 54.23	2.4615	15 53 29.4	12.378
9	20 16 22.96	2.5590	23 5 56.5	5.644	9	22 17 21.83	2.4583	15 41 3.3	12.492
10	20 18 56.49	2.5587	23 0 13.0	5.807	10	22 19 49.24	2.4551	15 28 30.4	12.603
11	20 21 30.00	2.5582	22 54 19.7	5.968	11	22 22 16.45	2.4519	15 15 50.9	12.713
12	20 24 3.48	2.5577	22 48 16.8	6.129	12	22 24 43.47	2.4487	15 3 4.8	12.822
13	20 26 36.93	2.5571	22 42 4.2	6.290	13	22 27 10.30	2.4455	14 50 12.2	12.929
14	20 29 10.33	2.5563	22 35 42.0	6.451	14	22 29 36.93	2.4422	14 37 13.3	13.034
15	20 31 43.69	2.5556	22 29 10.1	6.611	15	22 32 3.37	2.4391	14 24 8.1	13.138
16	20 34 17.00	2.5547	22 22 28.7	6.770	16	22 34 29.62	2.4359	14 10 56.7	13.240
17	20 36 50.25	2.5537	22 15 37.7	6.929	17	22 36 55.68	2.4327	13 57 39.3	13.339
18	20 39 23.44	2.5526	22 8 37.2	7.087	18	22 39 21.54	2.4294	13 44 16.0	13.437
19	20 41 56.56	2.5513	22 1 27.2	7.245	19	22 41 47.21	2.4262	13 30 46.8	13.535
20	20 44 29.60	2.5501	21 54 7.8	7.402	20	22 44 12.69	2.4230	13 17 11.8	13.630
21	20 47 2.57	2.5488	21 46 39.0	7.558	21	22 46 37.98	2.4198	13 3 31.2	13.722
22	20 49 35.46	2.5474	21 39 0.8	7.714	22	22 49 3.07	2.4166	12 49 45.1	13.813
23	20 52 8.26	2.5458	S. 21 31 13.3	7.868	23	22 51 27.97	2.4134	S. 12 35 53.6	13.903
	THURSDAY 18.					SATURDAY 20.			
0	20 54 40.96	2.5442	S. 21 23 16.6	8.022	0	22 53 52.68	2.4102	S. 12 21 56.7	13.992
1	20 57 13.56	2.5425	21 15 10.6	8.176	1	22 56 17.20	2.4072	12 7 54.6	14.077
2	20 59 46.06	2.5407	21 6 55.5	8.328	2	22 58 41.54	2.4041	11 53 47.5	14.160
3	21 2 18.45	2.5388	20 58 31.2	8.480	3	23 1 5.69	2.4009	11 39 35.4	14.242
4	21 4 50.72	2.5369	20 49 57.9	8.630	4	23 3 29.65	2.3978	11 25 18.4	14.322
5	21 7 22.88	2.5350	20 41 15.6	8.780	5	23 5 53.43	2.3947	11 10 56.7	14.401
6	21 9 54.92	2.5330	20 32 24.3	8.929	6	23 8 17.03	2.3917	10 56 30.3	14.477
7	21 12 26.84	2.5308	20 23 24.1	9.077	7	23 10 40.44	2.3887	10 41 59.4	14.552
8	21 14 58.62	2.5286	20 14 15.1	9.223	8	23 13 3.67	2.3857	10 27 24.1	14.625
9	21 17 30.27	2.5264	20 4 57.3	9.370	9	23 15 26.73	2.3828	10 12 44.4	14.696
10	21 20 1.79	2.5241	19 55 30.7	9.514	10	23 17 49.61	2.3798	9 58 0.6	14.764
11	21 22 33.16	2.5217	19 45 55.6	9.657	11	23 20 12.31	2.3769	9 43 12.7	14.831
12	21 25 4.39	2.5192	19 36 11.8	9.801	12	23 22 34.84	2.3740	9 28 20.9	14.896
13	21 27 35.47	2.5167	19 26 19.5	9.942	13	23 24 57.20	2.3712	9 13 25.2	14.959
14	21 30 6.40	2.5142	19 16 18.8	10.081	14	23 27 19.38	2.3684	8 58 25.8	15.020
15	21 32 37.17	2.5116	19 6 9.8	10.220	15	23 29 41.40	2.3657	8 43 22.8	15.079
16	21 35 7.79	2.5090	18 55 52.4	10.358	16	23 32 3.26	2.3629	8 28 16.3	15.137
17	21 37 38.25	2.5062	18 45 26.8	10.495	17	23 34 24.95	2.3602	8 13 6.4	15.192
18	21 40 8.54	2.5035	18 34 53.0	10.631	18	23 36 46.48	2.3575	7 57 53.3	15.244
19	21 42 38.66	2.5007	18 24 11.1	10.764	19	23 39 7.85	2.3549	7 42 37.1	15.296
20	21 45 8.62	2.4978	18 13 21.3	10.897	20	23 41 29.07	2.3523	7 27 17.8	15.345
21	21 47 38.41	2.4951	18 2 23.5	11.028	21	23 43 50.14	2.3498	7 11 55.7	15.392
22	21 50 8.03	2.4922	17 51 17.9	11.158	22	23 46 11.05	2.3473	6 56 30.8	15.437
23	21 52 37.47	2.4892	17 40 4.5	11.287	23	23 48 31.81	2.3448	6 41 3.2	15.481
24	21 55 6.73	2.4862	S. 17 28 43.5	11.414	24	23 50 52.42	2.3423	S. 6 25 33.1	15.522

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.			Diff. for 1 Minute.	Declination.				Diff. for 1 Minute.
	SUNDAY 21.								
	h	m	s	s		°	′	″	″
0	23	50	52.42	2.3423	S.	6	25	33.1	15.522
1	23	53	12.89	2.3400		6	10	0.6	15.562
2	23	55	33.22	2.3377		5	54	25.7	15.599
3	23	57	53.41	2.3354		5	38	48.7	15.634
4	0	0	13.47	2.3332		5	23	9.6	15.667
5	0	2	33.39	2.3309		5	7	28.6	15.699
6	0	4	53.18	2.3288		4	51	45.7	15.729
7	0	7	12.85	2.3267		4	36	1.1	15.756
8	0	9	32.39	2.3247		4	20	15.0	15.781
9	0	11	51.81	2.3227		4	4	27.4	15.805
10	0	14	11.11	2.3207		3	48	38.5	15.826
11	0	16	30.30	2.3188		3	32	48.3	15.845
12	0	18	49.37	2.3169		3	16	57.0	15.863
13	0	21	8.33	2.3152		3	1	4.7	15.878
14	0	23	27.19	2.3135		2	45	11.6	15.892
15	0	25	45.95	2.3118		2	29	17.7	15.904
16	0	28	4.61	2.3102		2	13	23.1	15.913
17	0	30	23.17	2.3085		1	57	28.0	15.921
18	0	32	41.63	2.3070		1	41	32.5	15.927
19	0	35	0.01	2.3056		1	25	36.8	15.931
20	0	37	18.30	2.3041		1	9	40.9	15.932
21	0	39	36.50	2.3027		0	53	44.9	15.933
22	0	41	54.63	2.3015		0	37	48.9	15.932
23	0	44	12.68	2.3002	S.	0	21	53.1	15.927
	MONDAY 22.								
0	0	46	30.65	2.2989	S.	0	5	57.7	15.920
1	0	48	48.55	2.2978	N.	0	9	57.3	15.912
2	0	51	6.39	2.2967		0	25	51.8	15.903
3	0	53	24.16	2.2957		0	41	45.7	15.892
4	0	55	41.87	2.2947		0	57	38.8	15.878
5	0	57	59.52	2.2937		1	13	31.1	15.862
6	1	0	17.12	2.2929		1	29	22.4	15.846
7	1	2	34.67	2.2921		1	45	12.6	15.827
8	1	4	52.17	2.2912		2	1	1.7	15.807
9	1	7	9.62	2.2905		2	16	49.4	15.783
10	1	9	27.03	2.2898		2	32	35.7	15.758
11	1	11	44.40	2.2892		2	48	20.4	15.732
12	1	14	1.74	2.2887		3	4	3.5	15.703
13	1	16	19.05	2.2882		3	19	44.8	15.673
14	1	18	36.32	2.2877		3	35	24.3	15.642
15	1	20	53.57	2.2873		3	51	1.8	15.608
16	1	23	10.80	2.2870		4	6	37.2	15.572
17	1	25	28.01	2.2867		4	22	10.5	15.535
18	1	27	45.20	2.2864		4	37	41.5	15.497
19	1	30	2.38	2.2862		4	53	10.1	15.456
20	1	32	19.55	2.2861		5	8	36.2	15.412
21	1	34	36.71	2.2860		5	23	59.6	15.368
22	1	36	53.87	2.2859		5	39	20.4	15.323
23	1	39	11.02	2.2859		5	54	38.4	15.275
24	1	41	28.18	2.2860	N.	6	9	53.4	15.225

Hour.	Right Ascension.			Diff. for 1 Minute.	Declination.				Diff. for 1 Minute.
	TUESDAY 23.								
	h	m	s	s		°	′	″	″
0	1	41	28.18	2.2860	N.	6	9	53.4	15.225
1	1	43	45.34	2.2860		6	25	5.4	15.174
2	1	46	2.50	2.2862		6	40	14.3	15.122
3	1	48	19.68	2.2864		6	55	20.1	15.068
4	1	50	36.87	2.2866		7	10	22.5	15.012
5	1	52	54.07	2.2869		7	25	21.5	14.954
6	1	55	11.29	2.2872		7	40	17.0	14.895
7	1	57	28.53	2.2875		7	55	8.9	14.834
8	1	59	45.79	2.2879		8	9	57.1	14.772
9	2	2	3.07	2.2883		8	24	41.5	14.707
10	2	4	20.39	2.2888		8	39	22.0	14.642
11	2	6	37.74	2.2894		8	53	58.5	14.575
12	2	8	55.12	2.2900		9	8	31.0	14.507
13	2	11	12.54	2.2906		9	22	59.3	14.436
14	2	13	29.99	2.2912		9	37	23.3	14.364
15	2	15	47.48	2.2919		9	51	43.0	14.292
16	2	18	5.02	2.2926		10	5	58.3	14.217
17	2	20	22.60	2.2933		10	20	9.1	14.141
18	2	22	40.22	2.2942		10	34	15.2	14.062
19	2	24	57.90	2.2950		10	48	16.6	13.984
20	2	27	15.62	2.2958		11	2	13.3	13.904
21	2	29	33.39	2.2967		11	16	5.1	13.822
22	2	31	51.22	2.2977		11	29	52.0	13.739
23	2	34	9.11	2.2986	N.	11	43	33.8	13.654
	WEDNESDAY 24.								
0	2	36	27.05	2.2995	N.	11	57	10.5	13.568
1	2	38	45.05	2.3005		12	10	42.0	13.481
2	2	41	3.11	2.3016		12	24	8.2	13.392
3	2	43	21.23	2.3026		12	37	29.1	13.302
4	2	45	39.42	2.3036		12	50	44.5	13.211
5	2	47	57.67	2.3047		13	3	54.4	13.118
6	2	50	15.99	2.3059		13	16	58.7	13.025
7	2	52	34.38	2.3070		13	29	57.4	12.931
8	2	54	52.83	2.3081		13	42	50.4	12.834
9	2	57	11.35	2.3093		13	55	37.5	12.736
10	2	59	29.94	2.3105		14	8	18.7	12.637
11	3	1	48.61	2.3117		14	20	54.0	12.537
12	3	4	7.35	2.3129		14	33	23.2	12.436
13	3	6	26.16	2.3142		14	45	46.3	12.334
14	3	8	45.05	2.3154		14	58	3.3	12.231
15	3	11	4.01	2.3167		15	10	14.0	12.126
16	3	13	23.05	2.3179		15	22	18.4	12.021
17	3	15	42.16	2.3192		15	34	16.5	11.915
18	3	18	1.35	2.3204		15	46	8.2	11.807
19	3	20	20.61	2.3217		15	57	53.3	11.697
20	3	22	39.95	2.3230		16	9	31.9	11.588
21	3	24	59.37	2.3242		16	21	3.9	11.477
22	3	27	18.86	2.3255		16	32	29.2	11.365
23	3	29	38.43	2.3268		16	43	47.7	11.252
24	3	31	58.08	2.3282	N.	16	54	59.5	11.139

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	THURSDAY 25.			
	h m s	s	° ′ ″	″
0	3 31 58.08.	2.3282	N.16 54 59.5	11.139
1	3 34 17.81	2.3294	17 6 4.4	11.024
2	3 36 37.61	2.3307	17 17 2.4	10.909
3	3 38 57.49	2.3319	17 27 53.5	10.792
4	3 41 17.44	2.3332	17 38 37.5	10.674
5	3 43 37.47	2.3345	17 49 14.4	10.556
6	3 45 57.58	2.3357	17 59 44.2	10.437
7	3 48 17.76	2.3369	18 10 6.8	10.317
8	3 50 38.01	2.3381	18 20 22.2	10.196
9	3 52 58.33	2.3393	18 30 30.3	10.073
10	3 55 18.73	2.3405	18 40 31.0	9.951
11	3 57 39.20	2.3417	18 50 24.4	9.827
12	3 59 59.74	2.3428	19 0 10.3	9.703
13	4 2 20.34	2.3440	19 9 48.8	9.579
14	4 4 41.01	2.3451	19 19 19.8	9.453
15	4 7 1.75	2.3462	19 28 43.2	9.327
16	4 9 22.56	2.3473	19 37 59.0	9.200
17	4 11 43.43	2.3483	19 47 7.2	9.072
18	4 14 4.36	2.3493	19 56 7.7	8.944
19	4 16 25.35	2.3503	20 5 0.5	8.815
20	4 18 46.40	2.3512	20 13 45.5	8.686
21	4 21 7.50	2.3522	20 22 22.8	8.556
22	4 23 28.66	2.3532	20 30 52.2	8.425
23	4 25 49.88	2.3540	N.20 39 13.8	8.293
	FRIDAY 26.			
0	4 28 11.14	2.3547	N.20 47 27.4	8.161
1	4 30 32.45	2.3556	20 55 33.1	8.029
2	4 32 53.81	2.3564	21 3 30.9	7.897
3	4 35 15.22	2.3571	21 11 20.7	7.763
4	4 37 36.67	2.3577	21 19 2.5	7.629
5	4 39 58.15	2.3584	21 26 36.2	7.495
6	4 42 19.67	2.3590	21 34 1.9	7.360
7	4 44 41.23	2.3596	21 41 19.4	7.225
8	4 47 2.82	2.3601	21 48 28.9	7.090
9	4 49 24.44	2.3606	21 55 30.2	6.953
10	4 51 46.09	2.3610	22 2 23.3	6.817
11	4 54 7.76	2.3613	22 9 8.2	6.680
12	4 56 29.45	2.3617	22 15 44.9	6.543
13	4 58 51.16	2.3619	22 22 13.4	6.406
14	5 1 12.88	2.3622	22 28 33.6	6.268
15	5 3 34.62	2.3624	22 34 45.6	6.131
16	5 5 56.37	2.3625	22 40 49.3	5.992
17	5 8 18.12	2.3626	22 46 44.7	5.854
18	5 10 39.88	2.3627	22 52 31.8	5.715
19	5 13 1.64	2.3626	22 58 10.5	5.576
20	5 15 23.39	2.3624	23 3 40.9	5.437
21	5 17 45.13	2.3623	23 9 3.0	5.298
22	5 20 6.87	2.3621	23 14 16.7	5.158
23	5 22 28.59	2.3618	23 19 22.0	5.019
24	5 24 50.29	2.3615	N.23 24 19.0	4.880

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	SATURDAY 27.			
	h m s	s	° ′ ″	″
0	5 24 50.29	2.3615	N.23 24 19.0	4.880
1	5 27 11.97	2.3612	23 29 7.6	4.740
2	5 29 33.63	2.3607	23 33 47.8	4.600
3	5 31 55.26	2.3602	23 38 19.6	4.460
4	5 34 16.86	2.3597	23 42 43.0	4.321
5	5 36 38.42	2.3590	23 46 58.1	4.181
6	5 38 59.94	2.3583	23 51 4.7	4.040
7	5 41 21.42	2.3576	23 55 2.9	3.900
8	5 43 42.86	2.3568	23 58 52.7	3.761
9	5 46 4.24	2.3559	24 2 34.2	3.621
10	5 48 25.57	2.3550	24 6 7.2	3.480
11	5 50 46.84	2.3540	24 9 31.8	3.341
12	5 53 8.05	2.3529	24 12 48.1	3.202
13	5 55 29.19	2.3518	24 15 56.0	3.062
14	5 57 50.27	2.3506	24 18 55.5	2.922
15	6 0 11.27	2.3493	24 21 46.6	2.782
16	6 2 32.19	2.3480	24 24 29.4	2.644
17	6 4 53.03	2.3467	24 27 3.9	2.505
18	6 7 13.79	2.3452	24 29 30.0	2.366
19	6 9 34.46	2.3437	24 31 47.8	2.227
20	6 11 55.04	2.3422	24 33 57.3	2.088
21	6 14 15.52	2.3405	24 35 58.4	1.950
22	6 16 35.90	2.3388	24 37 51.3	1.812
23	6 18 56.18	2.3371	N.24 39 35.9	1.675
	SUNDAY 28.			
0	6 21 16.35	2.3352	N.24 41 12.3	1.537
1	6 23 36.41	2.3333	24 42 40.4	1.400
2	6 25 56.35	2.3313	24 44 0.3	1.264
3	6 28 16.17	2.3293	24 45 12.0	1.12
4	6 30 35.87	2.3273	24 46 15.6	0.991
5	6 32 55.45	2.3252	24 47 11.0	0.855
6	6 35 14.89	2.3229	24 47 58.2	0.719
7	6 37 34.20	2.3206	24 48 37.3	0.584
8	6 39 53.37	2.3183	24 49 8.3	0.450
9	6 42 12.40	2.3160	24 49 31.3	0.316
10	6 44 31.28	2.3135	24 49 46.2	0.181
11	6 46 50.02	2.3110	24 49 53.0	+0.047
12	6 49 8.61	2.3085	24 49 51.9	−0.085
13	6 51 27.04	2.3058	24 49 42.8	0.217
14	6 53 45.31	2.3031	24 49 25.8	0.350
15	6 56 3.41	2.3003	24 49 0.8	0.482
16	6 58 21.35	2.2976	24 48 28.0	0.612
17	7 0 39.12	2.2947	24 47 47.3	0.743
18	7 2 56.72	2.2918	24 46 58.8	0.874
19	7 5 14.14	2.2888	24 46 2.4	1.004
20	7 7 31.38	2.2858	24 44 58.3	1.132
21	7 9 48.44	2.2827	24 43 46.5	1.261
22	7 12 5.31	2.2797	24 42 27.0	1.389
23	7 14 21.99	2.2765	24 40 59.8	1.517
24	7 16 38.48	2.2732	N.24 39 24.9	1.644

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
		MONDAY 29.		
	h m s	s	° ′ ″	″
0	7 16 38.48	2.2732	N.24 39 24.9	1.644
1	7 18 54.78	2.2700	24 37 42.5	1.770
2	7 21 10.89	2.2667	24 35 52.5	1.897
3	7 23 26.80	2.2634	24 33 54.9	2.022
4	7 25 42.50	2.2599	24 31 49.9	2.146
5	7 27 57.99	2.2565	24 29 37.4	2.270
6	7 30 13.28	2.2530	24 27 17.5	2.393
7	7 32 28.35	2.2494	24 24 50.2	2.517
8	7 34 43.21	2.2459	24 22 15.5	2.638
9	7 36 57.86	2.2423	24 19 33.6	2.759
10	7 39 12.29	2.2387	24 16 44.4	2.881
11	7 41 26.50	2.2349	24 13 47.9	3.001
12	7 43 40.48	2.2312	24 10 44.3	3.120
13	7 45 54.24	2.2274	24 7 33.5	3.239
14	7 48 7.77	2.2236	24 4 15.6	3.357
15	7 50 21.07	2.2197	24 0 50.7	3.474
16	7 52 34.14	2.2159	23 57 18.7	3.592
17	7 54 46.98	2.2121	23 53 39.7	3.707
18	7 56 59.58	2.2081	23 49 53.8	3.822
19	7 59 11.95	2.2041	23 46 1.0	3.937
20	8 1 24.08	2.2002	23 42 1.3	4.052
21	8 3 35.97	2.1962	23 37 54.8	4.165
22	8 5 47.62	2.1921	23 33 41.5	4.277
23	8 7 59.02	2.1880	N.23 29 21.5	4.389
		TUESDAY 30.		
0	8 10 10.18	2.1839	N.23 24 54.8	4.500
1	8 12 21.09	2.1798	23 20 21.5	4.610
2	8 14 31.76	2.1757	23 15 41.6	4.720
3	8 16 42.18	2.1715	23 10 55.1	4.829
4	8 18 52.34	2.1673	23 6 2.1	4.937
5	8 21 2.26	2.1632	23 1 2.7	5.044
6	8 23 11.93	2.1590	22 55 56.9	5.151
7	8 25 21.34	2.1547	22 50 44.7	5.257
8	8 27 30.50	2.1506	22 45 26.1	5.362
9	8 29 39.41	2.1463	22 40 1.2	5.466
10	8 31 48.06	2.1420	22 34 30.1	5.569
11	8 33 56.45	2.1377	22 28 52.9	5.672
12	8 36 4.59	2.1335	22 23 9.5	5.773
13	8 38 12.47	2.1292	22 17 20.1	5.874
14	8 40 20.10	2.1250	22 11 24.6	5.975
15	8 42 27.47	2.1207	22 5 23.1	6.075
16	8 44 34.58	2.1164	21 59 15.6	6.173
17	8 46 41.43	2.1121	21 53 2.3	6.271
18	8 48 48.03	2.1077	21 46 43.1	6.368
19	8 50 54.37	2.1035	21 40 18.1	6.465
20	8 53 0.45	2.0992	21 33 47.3	6.561
21	8 55 6.27	2.0949	21 27 10.8	6.656
22	8 57 11.83	2.0906	21 20 28.6	6.750
23	8 59 17.14	2.0862	21 13 40.8	6.842
24	9 1 22.19	2.0820	N.21 6 47.5	6.935

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
		WEDNESDAY 31.		
	h m s	s	° ′ ″	″
0	9 1 22.19	2.0820	N.21 6 47.5	6.935
1	9 3 26.98	2.0777	20 59 48.6	7.027
2	9 5 31.52	2.0735	20 52 44.3	7.117
3	9 7 35.80	2.0692	20 45 34.5	7.208
4	9 9 39.82	2.0649	20 38 19.3	7.297
5	9 11 43.59	2.0607	20 30 58.8	7.386
6	9 13 47.10	2.0564	20 23 33.0	7.474
7	9 15 50.36	2.0522	20 16 1.9	7.561
8	9 17 53.37	2.0480	20 8 25.7	7.647
9	9 19 56.12	2.0438	20 0 44.3	7.732
10	9 21 58.63	2.0397	19 52 57.8	7.817
11	9 24 0.88	2.0354	19 45 6.2	7.901
12	9 26 2.88	2.0312	19 37 9.7	7.983
13	9 28 4.63	2.0272	19 29 8.2	8.066
14	9 30 6.14	2.0231	19 21 1.8	8.147
15	9 32 7.40	2.0189	19 12 50.6	8.227
16	9 34 8.41	2.0147	19 4 34.5	8.307
17	9 36 9.17	2.0107	18 56 13.7	8.387
18	9 38 9.70	2.0067	18 47 48.1	8.465
19	9 40 9.98	2.0027	18 39 17.9	8.542
20	9 42 10.03	1.9987	18 30 43.0	8.620
21	9 44 9.83	1.9947	18 22 3.5	8.696
22	9 46 9.39	1.9907	18 13 19.5	8.770
23	9 48 8.72	1.9869	N.18 4 31.1	8.844
		THURSDAY, APRIL 1.		
0	9 50 7.82	1.9830	N.17 55 38.2	8.918

PHASES OF THE MOON.

			d	h	m
○	Full Moon	Mar.	6	14	55.8
☾	Last Quarter		14	15	41.7
●	New Moon		21	8	11.3
☽	First Quarter		28	4	48.7

			d	h
☾	Apogee	Mar.	6	20.0
☾	Perigee		20	23.4

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.			P. L. of Diff.	IIIh			P. L. of Diff.	VIh			P. L. of Diff.	IXh			P. L. of Diff.
			°	′	″		°	′	″		°	′	″		°	′	″	
1	SUN	W.	117	57	44	3247	119	22	58	3259	120	47	58	3270	122	12	44	3282
	SATURN	W.	89	17	2	2904	90	49	16	2914	92	21	16	2924	93	53	4	2934
	α Arietis	W.	62	4	28	3016	63	34	21	3022	65	4	7	3028	66	33	45	3034
	Aldebaran	W.	30	28	31	2902	32	0	47	2909	33	32	54	2916	35	4	52	2924
	Regulus	E.	50	18	52	2879	48	46	6	2890	47	13	34	2901	45	41	16	2911
	JUPITER	E.	61	12	46	2824	59	38	49	2835	58	5	6	2845	56	31	36	2855
	Spica	E.	104	21	23	2888	102	48	49	2898	101	16	27	2907	99	44	17	2916
2	SATURN	W.	101	29	6	2979	102	59	45	2987	104	30	14	2994	106	0	34	3002
	α Arietis	W.	73	59	59	3065	75	28	51	3071	76	57	36	3077	78	26	13	3083
	Aldebaran	W.	42	42	30	2958	44	13	36	2965	45	44	33	2971	47	15	22	2977
	Regulus	E.	38	3	6	2963	36	32	7	2974	35	1	22	2985	33	30	50	2995
	JUPITER	E.	48	47	14	2901	47	14	56	2910	45	42	50	2918	44	10	54	2926
	Spica	E.	92	6	21	2960	90	35	19	2968	89	4	26	2975	87	33	44	2982
3	SATURN	W.	113	29	57	3036	114	59	25	3042	116	28	46	3047	117	58	0	3052
	α Arietis	W.	85	47	33	3112	87	15	29	3118	88	43	17	3123	90	10	59	3128
	Aldebaran	W.	54	47	36	3005	56	17	42	3011	57	47	41	3016	59	17	34	3021
	JUPITER	E.	36	33	44	2965	35	2	47	2973	33	32	0	2980	32	1	22	2988
	Spica	E.	80	2	17	3016	78	32	25	3022	77	2	40	3028	75	33	2	3034
	Antares	E.	125	56	5	3022	124	26	19	3026	122	56	38	3030	121	27	3	3034
4	α Arietis	W.	97	27	59	3153	98	55	4	3158	100	22	4	3163	101	48	58	3168
	Aldebaran	W.	66	45	35	3042	68	14	56	3045	69	44	13	3048	71	13	26	3052
	Pollux	W.	22	47	15	3101	24	15	23	3098	25	43	35	3095	27	11	51	3093
	Spica	E.	68	6	33	3060	66	37	34	3064	65	8	40	3069	63	39	52	3073
	Antares	E.	114	0	23	3053	112	31	16	3057	111	2	14	3060	109	33	16	3063
5	α Arietis	W.	109	2	0	3192	110	28	19	3197	111	54	32	3202	113	20	39	3208
	Aldebaran	W.	78	38	31	3066	80	7	22	3068	81	36	11	3070	83	4	57	3072
	Pollux	W.	34	33	39	3089	36	2	2	3088	37	30	26	3088	38	58	50	3088
	Spica	E.	56	17	8	3093	54	48	50	3097	53	20	36	3101	51	52	27	3105
	Antares	E.	102	9	17	3076	100	40	38	3078	99	12	2	3080	97	43	28	3082
6	Aldebaran	W.	90	28	14	3079	91	56	49	3081	93	25	22	3082	94	53	54	3083
	Pollux	W.	46	20	47	3089	47	49	10	3089	49	17	33	3089	50	45	56	3089
	Spica	E.	44	32	52	3124	43	5	11	3128	41	37	35	3133	40	10	5	3137
	Antares	E.	90	21	10	3089	88	52	47	3090	87	24	26	3091	85	56	5	3092
7	Aldebaran	W.	102	16	22	3084	103	44	51	3084	105	13	20	3084	106	41	49	3083
	Pollux	W.	58	7	55	3087	59	36	21	3086	61	4	47	3085	62	33	15	3084
	Regulus	W.	22	16	8	3146	23	43	22	3138	25	10	45	3131	26	38	16	3124
	Spica	E.	32	54	4	3167	31	27	15	3174	30	0	35	3183	28	34	6	3194
	Antares	E.	78	34	34	3094	77	6	17	3094	75	38	0	3093	74	9	42	3093
	α Aquilæ	E.	121	7	17	4130	119	57	44	4099	118	47	41	4070	117	37	10	4043
8	Pollux	W.	69	55	55	3077	71	24	33	3075	72	53	13	3073	74	21	56	3071
	Regulus	W.	33	57	43	3099	35	25	54	3095	36	54	9	3091	38	22	29	3087
	JUPITER	W.	23	55	38	3063	25	24	33	3057	26	53	35	3052	28	22	44	3047
	Antares	E.	66	48	6	3090	65	19	44	3089	63	51	21	3087	62	22	56	3086
	α Aquilæ	E.	111	38	23	3930	110	25	34	3912	109	12	26	3895	107	59	1	3880

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XV^{h}	P. L. of Diff.	XVIII^{h}	P. L. of Diff.	XXI^{h}	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
1	Sun	W.	123 37 17	3293	125 1 37	3303	126 25 45	3313	127 49 41	3324
	Saturn	W.	95 24 40	2944	96 56 3	2953	98 27 15	2962	99 58 16	2970
	α Arietis	W.	68 3 15	3041	69 32 37	3047	71 1 52	3053	72 30 59	3059
	Aldebaran	W.	36 36 41	2931	38 8 21	2937	39 39 53	2944	41 11 16	2951
	Regulus	E.	44 9 11	2922	42 37 20	2932	41 5 42	2943	39 34 17	2953
	Jupiter	E.	54 58 19	2865	53 25 15	2874	51 52 23	2883	50 19 43	2892
	Spica	E.	98 12 19	2926	96 40 33	2935	95 8 58	2943	93 37 34	2952
2	Saturn	W.	107 30 44	3009	109 0 45	3016	110 30 37	3023	112 0 21	3030
	α Arietis	W.	79 54 43	3089	81 23 6	3095	82 51 22	3101	84 19 31	3106
	Aldebaran	W.	48 46 4	2983	50 16 38	2989	51 47 4	2995	53 17 23	3000
	Regulus	E.	32 0 31	3005	30 30 25	3016	29 0 32	3027	27 30 52	3038
	Jupiter	E.	42 39 8	2934	41 7 33	2942	39 36 7	2950	38 4 51	2957
	Spica	E.	86 3 8	2989	84 32 42	2997	83 2 26	3004	81 32 18	3010
3	Saturn	W.	119 27 8	3058	120 56 9	3063	122 25 3	3068	123 53 52	3073
	α Arietis	W.	91 38 36	3133	93 6 6	3138	94 33 30	3143	96 0 48	3148
	Aldebaran	W.	60 47 21	3026	62 17 2	3030	63 46 38	3034	65 16 9	3038
	Jupiter	E.	30 30 54	2996	29 0 35	3004	27 30 27	3012	26 0 29	3021
	Spica	E.	74 3 31	3039	72 34 7	3045	71 4 50	3050	69 35 39	3055
	Antares	E.	119 57 33	3039	118 28 8	3043	116 58 49	3047	115 29 34	3050
4	α Arietis	W.	103 15 46	3173	104 42 28	3178	106 9 5	3183	107 35 35	3188
	Aldebaran	W.	72 42 34	3055	74 11 38	3058	75 40 39	3060	77 9 37	3063
	Pollux	W.	28 40 10	3091	30 8 31	3090	31 36 53	3089	33 5 16	3089
	Spica	E.	62 11 9	3077	60 42 31	3081	59 13 59	3085	57 45 31	3089
	Antares	E.	108 4 21	3066	106 35 30	3069	105 6 43	3071	103 37 59	3073
5	α Arietis	W.	114 46 39	3213	116 12 33	3218	117 38 21	3224	119 4 2	3230
	Aldebaran	W.	84 33 40	3074	86 2 21	3076	87 31 0	3077	88 59 38	3078
	Pollux	W.	40 27 14	3089	41 55 37	3089	43 24 0	3089	44 52 23	3089
	Spica	E.	50 24 23	3108	48 56 23	3112	47 28 28	3116	46 0 38	3120
	Antares	E.	96 14 57	3084	94 46 28	3085	93 18 0	3087	91 49 34	3088
6	Aldebaran	W.	96 22 24	3083	97 50 54	3083	99 19 24	3084	100 47 53	3084
	Pollux	W.	52 14 19	3089	53 42 42	3088	55 11 6	3088	56 39 30	3087
	Spica	E.	38 42 40	3142	37 15 21	3147	35 48 8	3153	34 21 2	3160
	Antares	E.	84 27 46	3092	82 59 27	3093	81 31 9	3093	80 2 51	3094
7	Aldebaran	W.	108 10 19	3083	109 38 49	3082	111 7 20	3081	112 35 52	3080
	Pollux	W.	64 1 44	3083	65 30 14	3082	66 58 46	3081	68 27 19	3079
	Regulus	W.	28 5 56	3119	29 33 43	3113	31 1 37	3108	32 29 37	3103
	Spica	E.	27 7 50	3207	25 41 49	3222	24 16 6	3239	22 50 43	3258
	Antares	E.	72 41 24	3093	71 13 6	3092	69 44 47	3091	68 16 27	3091
	α Aquilæ	E.	116 26 12	4017	115 14 49	3992	114 3 2	3970	112 50 53	3949
8	Pollux	W.	75 50 41	3069	77 19 29	3066	78 48 20	3063	80 17 15	3060
	Regulus	W.	39 50 54	3083	41 19 24	3079	42 47 58	3075	44 16 38	3071
	Jupiter	W.	29 51 59	3042	31 21 20	3036	32 50 48	3031	34 20 22	3026
	Antares	E.	60 54 29	3085	59 26 1	3083	57 57 31	3081	56 28 59	3079
	α Aquilæ	E.	106 45 21	3865	105 31 26	3851	104 17 16	3837	103 2 52	3825

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh	P. L. of Diff.	VIh	P. L. of Diff.	IXh	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
9	Pollux	W.	81 46 14	3057	83 15 17	3054	84 44 23	3050	86 13 34	3047
	Regulus	W.	45 45 23	3067	47 14 13	3063	48 43 8	3059	50 12 8	3054
	JUPITER	W.	35 50 2	3022	37 19 48	3018	38 49 39	3013	40 19 36	3008
	Antares	E.	55 0 24	3077	53 31 47	3075	52 3 7	3073	50 34 25	3071
	a Aquilæ	E.	101 48 16	3814	100 33 28	3803	99 18 29	3793	98 3 20	3784
10	Pollux	W.	93 40 43	3024	95 10 26	3019	96 40 15	3014	98 10 10	3008
	Regulus	W.	57 38 38	3029	59 8 15	3023	60 37 59	3017	62 7 50	3011
	JUPITER	W.	47 50 56	2982	49 21 31	2976	50 52 14	2970	52 23 5	2964
	Antares	E.	43 10 15	3060	41 41 16	3057	40 12 14	3055	38 43 9	3053
	a Aquilæ	E.	91 45 26	3748	90 29 30	3743	89 13 28	3738	87 57 21	3734
11	Pollux	W.	105 41 42	2976	107 12 25	2969	108 43 17	2961	110 14 19	2954
	Regulus	W.	69 39 7	2977	71 9 49	2969	72 40 40	2961	74 11 41	2953
	JUPITER	W.	59 59 17	2930	61 30 58	2922	63 2 49	2914	64 34 50	2905
	a Aquilæ	E.	81 35 52	3722	80 19 28	3721	79 3 3	3722	77 46 39	3723
	SUN	E.	131 59 2	3367	130 36 8	3358	129 13 4	3349	127 49 49	3339
12	Regulus	W.	81 49 31	2908	83 21 40	2898	84 54 2	2887	86 26 37	2876
	JUPITER	W.	72 17 38	2861	73 50 47	2851	75 24 8	2841	76 57 43	2830
	Spica	W.	28 12 4	3011	29 42 3	2991	31 12 27	2972	32 43 15	2953
	a Aquilæ	E.	71 25 13	3741	70 9 9	3748	68 53 13	3756	67 37 25	3766
	SUN	E.	120 50 39	3286	119 26 11	3275	118 1 30	3263	116 36 35	3251
13	Regulus	W.	94 13 7	2819	95 47 10	2806	97 21 30	2793	98 56 6	2780
	JUPITER	W.	84 49 13	2773	86 24 16	2760	87 59 36	2747	89 35 13	2735
	Spica	W.	40 22 51	2869	41 55 50	2853	43 29 9	2837	45 2 50	2821
	a Aquilæ	E.	61 21 25	3838	60 7 2	3858	58 53 0	3882	57 39 23	3910
	SUN	E.	109 28 20	3186	108 1 54	3172	106 35 11	3158	105 8 11	3143
14	Regulus	W.	106 53 34	2710	108 30 0	2696	110 6 45	2681	111 43 51	2666
	JUPITER	W.	97 37 44	2665	99 15 11	2650	100 52 57	2635	102 31 4	2620
	Spica	W.	52 56 29	2739	54 32 17	2722	56 8 28	2705	57 45 1	2689
	SUN	E.	97 48 40	3065	96 19 48	3049	94 50 36	3032	93 21 3	3015
15	JUPITER	W.	110 46 56	2540	112 27 13	2524	114 7 52	2508	115 48 54	2491
	Spica	W.	65 53 27	2603	67 32 18	2585	69 11 34	2567	70 51 14	2549
	SUN	E.	85 47 59	2927	84 16 15	2909	82 44 8	2891	81 11 38	2873
16	Spica	W.	79 15 48	2459	80 57 58	2441	82 40 34	2423	84 23 35	2405
	Antares	W.	33 27 24	2499	35 8 39	2475	36 50 27	2453	38 32 46	2431
	SUN	E.	73 23 8	2779	71 48 13	2760	70 12 53	2741	68 37 8	2723
17	Spica	W.	93 5 5	2317	94 50 39	2300	96 36 38	2283	98 23 2	2267
	Antares	W.	47 11 57	2328	48 57 15	2309	50 43 1	2290	52 29 15	2272
	SUN	E.	60 32 10	2630	58 53 56	2612	57 15 18	2595	55 36 16	2578
18	Spica	W.	107 21 1	2188	109 9 46	2174	110 58 52	2161	112 48 19	2147
	Antares	W.	61 26 59	2186	63 15 48	2170	65 5 0	2155	66 54 36	2140
	SUN	E.	47 15 23	2498	45 34 7	2484	43 52 31	2471	42 10 36	2458
19	Antares	W.	76 7 59	2074	77 59 38	2063	79 51 35	2052	81 43 49	2042

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.			P. L. of Diff.	XV^h			P. L. of Diff.	XVIII^h			P. L. of Diff.	XXI^h			P. L. of Diff.
			°	′	″		°	′	″		°	′	″		°	′	″	
9	Pollux	W.	87	42	49	3043	89	12	9	3038	90	41	35	3034	92	11	6	3029
	Regulus	W.	51	41	14	3049	53	10	26	3044	54	39	43	3039	56	9	7	3034
	JUPITER	W.	41	49	40	3003	43	19	49	2998	44	50	5	2993	46	20	27	2987
	Antares	E.	49	5	40	3069	47	36	53	3067	46	8	3	3065	44	39	10	3063
	a Aquilæ	E.	96	48	2	3776	95	32	35	3768	94	16	59	3761	93	1	16	3754
10	Pollux	W.	99	40	13	3002	101	10	23	2996	102	40	41	2989	104	11	7	2982
	Regulus	W.	63	37	49	3005	65	7	56	2998	66	38	11	2991	68	8	34	2984
	JUPITER	W.	53	54	3	2958	55	25	9	2951	56	56	23	2944	58	27	45	2937
	Antares	E.	37	14	1	3051	35	44	51	3049	34	15	38	3048	32	46	24	3047
	a Aquilæ	E.	86	41	10	3730	85	24	55	3727	84	8	36	3725	82	52	15	3723
11	Pollux	W.	111	45	30	2946	113	16	51	2937	114	48	23	2928	116	20	6	2919
	Regulus	W.	75	42	53	2944	77	14	15	2935	78	45	49	2926	80	17	34	2917
	JUPITER	W.	66	7	2	2898	67	39	24	2889	69	11	57	2880	70	44	42	2871
	a Aquilæ	E.	76	30	16	3725	75	13	55	3728	73	57	37	3731	72	41	23	3735
	SUN	E.	126	26	23	3329	125	2	45	3319	123	38	56	3308	122	14	54	3297
12	Regulus	W.	87	59	26	2865	89	32	29	2854	91	5	47	2843	92	39	19	2831
	JUPITER	W.	78	31	32	2819	80	5	35	2808	81	39	53	2797	83	14	25	2785
	Spica	W.	34	14	27	2935	35	46	1	2918	37	17	56	2901	38	50	13	2885
	a Aquilæ	E.	66	21	47	3777	65	6	20	3789	63	51	6	3803	62	36	7	3820
	SUN	E.	115	11	26	3238	113	46	3	3225	112	20	24	3212	110	54	30	3199
13	Regulus	W.	100	31	0	2767	102	6	11	2753	103	41	40	2739	105	17	28	2725
	JUPITER	W.	91	11	7	2721	92	47	18	2707	94	23	48	2693	96	0	37	2679
	Spica	W.	46	36	51	2805	48	11	13	2788	49	45	57	2772	51	21	2	2755
	a Aquilæ	E.	56	26	13	3940	55	13	33	3973	54	1	26	4010	52	49	56	4051
	SUN	E.	103	40	54	3128	102	13	19	3113	100	45	25	3097	99	17	12	3081
14	Regulus	W.	113	21	17	2650	114	59	4	2635	116	37	12	2619	118	15	41	2603
	JUPITER	W.	104	9	32	2605	105	48	20	2589	107	27	30	2573	109	7	2	2557
	Spica	W.	59	21	56	2672	60	59	14	2655	62	36	55	2638	64	14	59	2620
	SUN	E.	91	51	10	2998	90	20	55	2981	88	50	19	2963	87	19	20	2945
15	JUPITER	W.	117	30	20	2475	119	12	9	2458	120	54	22	2441	122	36	59	2423
	Spica	W.	72	31	19	2531	74	11	49	2513	75	52	43	2495	77	34	3	2477
	SUN	E.	79	38	44	2854	78	5	27	2835	76	31	45	2817	74	57	39	2798
16	Spica	W.	86	7	2	2387	87	50	55	2370	89	35	13	2353	91	19	56	2335
	Antares	W.	40	15	36	2410	41	58	56	2389	43	42	47	2368	45	27	8	2348
	SUN	E.	67	0	59	2704	65	24	24	2685	63	47	24	2666	62	9	59	2648
17	Spica	W.	100	9	50	2251	101	57	3	2235	103	44	39	2219	105	32	38	2203
	Antares	W.	54	15	55	2254	56	3	2	2236	57	50	36	2219	59	38	35	2202
	SUN	E.	53	56	51	2561	52	17	2	2545	50	36	51	2529	48	56	18	2513
18	Spica	W.	114	38	7	2134	116	28	14	2122	118	18	40	2111	120	9	23	2099
	Antares	W.	68	44	34	2126	70	34	54	2112	72	25	36	2099	74	16	38	2086
	SUN	E.	40	28	23	2445	38	45	53	2434	37	3	7	2424	35	20	6	2415
19	Antares	W.	83	36	18	2033	85	29	2	2024	87	21	59	2017	89	15	8	2010

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh	P. L. of Diff.	VIh	P. L. of Diff.	IXh	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
19	SUN	E.	33 36 53	2408	31 53 29	2402	30 9 56	2397	28 26 17	2395
23	SUN	W.	23 51 56	2460	25 34 6	2462	27 16 12	2467	28 58 11	2475
	Pollux	E.	86 42 36	2077	84 51 2	2090	82 59 47	2103	81 8 52	2117
	Regulus	E.	122 45 9	2082	120 53 42	2095	119 2 35	2108	117 11 47	2121
24	SUN	W.	37 24 51	2533	39 5 19	2548	40 45 26	2563	42 25 12	2579
	Pollux	E.	71 59 50	2194	70 11 13	2211	68 23 2	2228	66 35 16	2246
	Regulus	E.	108 3 7	2195	106 14 32	2212	104 26 21	2229	102 38 36	2245
	JUPITER	E.	116 11 43	2161	114 22 17	2177	112 33 14	2193	110 44 36	2210
25	SUN	W.	50 38 15	2668	52 15 38	2687	53 52 36	2706	55 29 8	2725
	Pollux	E.	57 43 5	2338	55 58 1	2357	54 13 25	2377	52 29 17	2396
	Regulus	E.	93 46 16	2335	92 1 8	2353	90 16 26	2372	88 32 11	2391
	JUPITER	E.	101 47 56	2300	100 1 56	2318	98 16 23	2337	96 31 17	2355
26	SUN	W.	63 25 21	2824	64 59 18	2843	66 32 50	2863	68 5 56	2883
	α Arietis	W.	33 53 29	2868	35 26 29	2856	36 59 44	2848	38 33 10	2843
	Pollux	E.	43 55 40	2497	42 14 22	2517	40 33 32	2538	38 53 11	2558
	Regulus	E.	79 57 45	2487	78 16 13	2506	76 35 8	2525	74 54 29	2544
	JUPITER	E.	87 52 34	2450	86 10 11	2469	84 28 14	2488	82 46 44	2506
27	SUN	W.	75 45 9	2981	77 15 46	2999	78 46 0	3018	80 15 51	3036
	α Arietis	W.	46 20 54	2852	47 54 15	2858	49 27 29	2865	51 0 34	2873
	Pollux	E.	30 38 35	2665	29 1 8	2687	27 24 10	2710	25 47 43	2733
	Regulus	E.	66 37 43	2637	64 59 38	2655	63 21 57	2672	61 44 40	2690
	JUPITER	E.	74 25 39	2598	72 46 41	2616	71 8 8	2634	69 29 59	2651
28	SUN	W.	87 39 31	3124	89 7 11	3140	90 34 32	3157	92 1 33	3173
	α Arietis	W.	58 43 9	2920	60 15 3	2930	61 46 44	2940	63 18 12	2951
	Aldebaran	W.	27 9 3	2817	28 43 9	2827	30 17 2	2837	31 50 42	2848
	Regulus	E.	53 44 4	2775	52 9 4	2791	50 34 25	2807	49 0 6	2823
	JUPITER	E.	61 24 57	2734	59 49 3	2750	58 13 29	2765	56 38 16	2780
29	SUN	W.	99 11 59	3247	100 37 13	3260	102 2 11	3274	103 26 53	3287
	α Arietis	W.	70 52 12	3004	72 22 20	3014	73 52 16	3023	75 22 0	3033
	Aldebaran	W.	39 35 35	2901	41 7 52	2912	42 39 56	2922	44 11 47	2932
	Regulus	E.	41 13 33	2898	39 41 12	2912	38 9 8	2927	36 37 23	2941
	JUPITER	E.	48 46 57	2851	47 13 35	2864	45 40 31	2877	44 7 43	2890
	Spica	E.	95 16 57	2895	93 44 32	2909	92 12 24	2921	90 40 31	2932
30	SUN	W.	110 26 50	3344	111 50 10	3354	113 13 19	3364	114 36 16	3374
	α Arietis	W.	82 47 42	3080	84 16 16	3089	85 44 40	3097	87 12 54	3105
	Aldebaran	W.	51 47 54	2979	53 18 33	2988	54 49 1	2996	56 19 19	3004
	Regulus	E.	29 3 5	3012	27 33 7	3027	26 3 27	3043	24 34 7	3059
	JUPITER	E.	36 27 40	2949	34 56 23	2961	33 25 21	2972	31 54 33	2983
	Spica	E.	83 4 37	2985	81 34 5	2994	80 3 45	3003	78 33 36	3012
31	SUN	W.	121 28 27	3415	122 50 26	3423	124 12 16	3430	125 33 59	3436
	α Arietis	W.	94 31 41	3141	95 59 0	3148	97 26 11	3155	98 53 14	3162
	Aldebaran	W.	63 48 33	3037	65 18 0	3043	66 47 19	3048	68 16 32	3053
	Spica	E.	71 5 27	3050	69 36 17	3057	68 7 15	3063	66 38 21	3069

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh	P. L. of Diff.	XVIIIh	P. L. of Diff.	XXIh	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
19	SUN	E.	26 42 35	2396	24 58 54	2399	23 15 17	2405	21 31 49	2415
23	SUN	W.	30 40 0	2484	32 21 36	2494	34 2 58	2505	35 44 4	2518
	Pollux	E.	79 18 18	2131	77 28 6	2146	75 38 17	2162	73 48 52	2178
	Regulus	E.	115 21 20	2135	113 31 14	2149	111 41 29	2163	109 52 6	2179
24	SUN	W.	44 4 36	2596	45 43 37	2613	47 22 14	2631	49 0 27	2649
	Pollux	E.	64 47 56	2264	63 1 3	2282	61 14 36	2300	59 28 37	2319
	Regulus	E.	100 51 16	2263	99 4 22	2281	97 17 54	2298	95 31 52	2316
	JUPITER	E.	108 56 24	2227	107 8 37	2245	105 21 17	2263	103 34 23	2281
25	SUN	W.	57 5 14	2745	58 40 54	2764	60 16 9	2784	61 50 58	2804
	Pollux	E.	50 45 36	2416	49 2 24	2436	47 19 41	2456	45 37 27	2476
	Regulus	E.	86 48 24	2410	85 5 4	2429	83 22 11	2448	81 39 45	2467
	JUPITER	E.	94 46 38	2374	93 2 26	2393	91 18 42	2412	89 35 25	2431
26	SUN	W.	69 38 36	2903	71 10 51	2922	72 42 42	2942	74 14 8	2962
	α Arietis	W.	40 6 42	2841	41 40 17	2840	43 13 53	2842	44 47 26	2846
	Pollux	E.	37 13 18	2579	35 33 54	2600	33 54 58	2621	32 16 32	2643
	Regulus	E.	73 14 16	2563	71 34 30	2581	69 55 9	2599	68 16 13	2618
	JUPITER	E.	81 5 39	2525	79 25 1	2543	77 44 48	2562	76 5 1	2580
27	SUN	W.	81 45 19	3054	83 14 24	3072	84 43 8	3090	86 11 30	3107
	α Arietis	W.	52 33 28	2881	54 6 11	2890	55 38 42	2899	57 11 2	2909
	Pollux	E.	24 11 47	2758	22 36 24	2784	21 1 37	2813	19 27 27	2844
	Regulus	E.	60 7 47	2708	58 31 18	2725	56 55 11	2742	55 19 26	2759
	JUPITER	E.	67 52 13	2668	66 14 51	2685	64 37 51	2701	63 1 13	2718
28	SUN	W.	93 28 14	3189	94 54 36	3204	96 20 41	3219	97 46 28	3233
	α Arietis	W.	64 49 27	2962	66 20 28	2972	67 51 16	2982	69 21 51	2993
	Aldebaran	W.	33 24 8	2859	34 57 20	2869	36 30 19	2880	38 3 4	2891
	Regulus	E.	47 26 8	2838	45 52 30	2854	44 19 12	2869	42 46 13	2883
	JUPITER	E.	55 3 22	2795	53 28 48	2810	51 54 33	2824	50 20 36	2838
29	SUN	W.	104 51 20	3299	106 15 33	3311	107 39 32	3322	109 3 17	3333
	α Arietis	W.	76 51 32	3043	78 20 52	3052	79 50 0	3061	81 18 57	3071
	Aldebaran	W.	45 43 25	2942	47 14 50	2952	48 46 3	2961	50 17 4	2970
	Regulus	E.	35 5 56	2955	33 34 47	2969	32 3 55	2983	30 33 21	2997
	JUPITER	E.	42 35 12	2902	41 2 56	2915	39 30 56	2927	37 59 11	2938
	Spica	E.	89 8 53	2943	87 37 29	2954	86 6 18	2965	84 35 21	2975
30	SUN	W.	115 59 2	3383	117 21 37	3392	118 44 3	3400	120 6 19	3408
	α Arietis	W.	88 40 58	3113	90 8 52	3120	91 36 37	3127	93 4 13	3134
	Aldebaran	W.	57 49 27	3011	59 19 26	3018	60 49 16	3024	62 18 58	3030
	Regulus	E.	23 5 7	3077	21 36 29	3097	20 8 15	3119	18 40 28	3144
	JUPITER	E.	30 23 59	2994	28 53 39	3005	27 23 32	3016	25 53 39	3027
	Spica	E.	77 3 39	3020	75 33 52	3028	74 4 14	3036	72 34 46	3043
31	SUN	W.	126 55 35	3442	128 17 4	3448	129 38 26	3454	130 59 42	3459
	α Arietis	W.	100 20 9	3168	101 46 57	3173	103 13 38	3179	104 40 12	3185
	Aldebaran	W.	69 45 38	3058	71 14 39	3063	72 43 34	3067	74 12 24	3070
	Spica	E.	65 9 34	3075	63 40 54	3081	62 12 21	3086	60 43 55	3091

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S					Sidereal Time of Semi-diameter Passing Meridian.	Equation of Time, to be Added to / Subtracted from Apparent Time.	Diff. for 1 Hour.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Semi-diameter.			
		h m s	s	° ′ ″	″	′ ″	s	m s	s
Thur.	1	0 40 54.47	9.096	N. 4 24 16.1	+57.91	16 1.84	64.48	4 5.00	0.758
Frid.	2	0 44 32.83	9.101	4 47 23.5	57.70	16 1.57	64.49	3 46.86	0.753
Sat.	3	0 48 11.30	9.106	5 10 25.8	57.48	16 1.30	64.51	3 28.83	0.748
SUN.	4	0 51 49.91	9.112	5 33 22.5	+57.24	16 1.03	64.53	3 10.94	0.743
Mon.	5	0 55 28.68	9.119	5 56 13.2	56.99	16 0.75	64.56	2 53.20	0.736
Tues.	6	0 59 7.62	9.126	6 18 57.7	56.72	16 0.47	64.59	2 35.63	0.728
Wed.	7	1 2 46.75	9.134	6 41 35.7	+56.44	16 0.19	64.62	2 18.26	0.719
Thur.	8	1 6 26.11	9.144	7 4 7.0	56.15	15 59.91	64.65	2 1.11	0.710
Frid.	9	1 10 5.70	9.155	7 26 31.1	55.85	15 59.63	64.69	1 44.20	0.700
Sat.	10	1 13 45.55	9.166	7 48 47.7	+55.53	15 59.35	64.72	1 27.55	0.688
SUN.	11	1 17 25.69	9.178	8 10 56.5	55.20	15 59.08	64.76	1 11.18	0.676
Mon.	12	1 21 6.12	9.191	8 32 57.2	54.86	15 58.81	64.80	0 55.10	0.663
Tues.	13	1 24 46.87	9.205	8 54 49.6	+54.50	15 58.53	64.85	0 39.33	0.650
Wed.	14	1 28 27.96	9.219	9 16 33.2	54.13	15 58.25	64.89	0 23.91	0.636
Thur.	15	1 32 9.40	9.234	9 38 7.6	53.74	15 57.97	64.94	0 8.84	0.621
Frid.	16	1 35 51.20	9.249	9 59 32.6	+53.34	15 57.70	64.99	0 5.87	0.605
Sat.	17	1 39 33.37	9.265	10 20 47.9	52.92	15 57.43	65.05	0 20.22	0.589
SUN.	18	1 43 15.94	9.282	10 41 53.1	52.49	15 57.16	65.10	0 34.17	0.573
Mon.	19	1 46 58.91	9.299	11 2 47.8	+52.05	15 56.90	65.16	0 47.72	0.556
Tues.	20	1 50 42.28	9.316	11 23 31.6	51.59	15 56.64	65.22	1 0.86	0.539
Wed.	21	1 54 26.08	9.333	11 44 4.2	51.12	15 56.38	65.29	1 13.58	0.521
Thur.	22	1 58 10.31	9.351	12 4 25.2	+50.63	15 56.12	65.35	1 25.88	0.503
Frid.	23	2 1 54.97	9.369	12 24 34.3	50.12	15 55.87	65.42	1 37.74	0.485
Sat.	24	2 5 40.07	9.388	12 44 31.1	49.60	15 55.62	65.49	1 49.16	0.466
SUN.	25	2 9 25.62	9.408	13 4 15.3	+49.07	15 55.38	65.56	2 0.13	0.447
Mon.	26	2 13 11.64	9.428	13 23 46.5	48.52	15 55.13	65.63	2 10.64	0.428
Tues.	27	2 16 58.13	9.448	13 43 4.4	47.96	15 54.89	65.70	2 20.68	0.408
Wed.	28	2 20 45.11	9.468	14 2 8.8	+47.39	15 54.65	65.77	2 30.23	0.388
Thur.	29	2 24 32.59	9.489	14 20 59.2	46.80	15 54.41	65.85	2 39.27	0.367
Frid.	30	2 28 20.58	9.510	14 39 35.2	46.20	15 54.17	65.92	2 47.81	0.346
Sat.	31	2 32 9.07	9.532	N. 14 57 56.6	+45.59	15 53.94	66.00	2 55.86	0.324

Note.—The mean time of semidiameter passing the meridian may be found by subtracting $0^{s}.18$ from the sidereal time. The sign + prefixed to the hourly change of declination indicates that north declinations are increasing.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Equation of Time, to be Subtracted from / Added to Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		h m s	s	° ′ ″	″	m s	s	h m s
Thur.	1	0 40 53.84	9.099	N. 4 24 12.2	+57.93	4 5.05	0.758	0 36 48.79
Frid.	2	0 44 32.25	9.103	4 47 19.9	57.72	3 46.91	0.753	0 40 45.34
Sat.	3	0 48 10.78	9.108	5 10 22.5	57.50	3 28.88	0.748	0 44 41.90
SUN.	4	0 51 49.43	9.114	5 33 19.4	+57.25	3 10.98	0.743	0 48 38.45
Mon.	5	0 55 28.24	9.121	5 56 10.4	57.00	2 53.24	0.736	0 52 35.00
Tues.	6	0 59 7.22	9.128	6 18 55.3	56.73	2 35.66	0.728	0 56 31.56
Wed.	7	1 2 46.40	9.137	6 41 33.7	+56.46	2 18.29	0.719	1 0 28.11
Thur.	8	1 6 25.80	9.147	7 4 5.2	56.17	2 1.14	0.710	1 4 24.66
Frid.	9	1 10 5.44	9.157	7 26 29.5	55.87	1 44.22	0.700	1 8 21.22
Sat.	10	1 13 45.33	9.168	7 48 46.4	+55.55	1 27.56	0.688	1 12 17.77
SUN.	11	1 17 25.51	9.180	8 10 55.5	55.21	1 11.18	0.676	1 16 14.32
Mon.	12	1 21 5.98	9.193	8 32 56.4	54.87	0 55.10	0.663	1 20 10.88
Tues.	13	1 24 46.77	9.206	8 54 49.0	+54.51	0 39.34	0.650	1 24 7.43
Wed.	14	1 28 27.90	9.221	9 16 32.8	54.13	0 23.92	0.635	1 28 3.98
Thur.	15	1 32 9.37	9.236	9 38 7.5	53.75	0 8.84	0.621	1 32 0.53
Frid.	16	1 35 51.21	9.251	9 59 32.7	+53.35	0 5.88	0.605	1 35 57.09
Sat.	17	1 39 33.42	9.267	10 20 48.2	52.93	0 20.22	0.589	1 39 53.64
SUN.	18	1 43 16.03	9.283	10 41 53.6	52.51	0 34.17	0.573	1 43 50.20
Mon.	19	1 46 59.03	9.300	11 2 48.4	+52.06	0 47.72	0.556	1 47 46.75
Tues.	20	1 50 42.44	9.318	11 23 32.4	51.60	1 0.87	0.539	1 51 43.31
Wed.	21	1 54 26.27	9.335	11 44 5.2	51.13	1 13.59	0.521	1 55 39.86
Thur.	22	1 58 10.53	9.353	12 4 26.4	+50.63	1 25.89	0.503	1 59 36.42
Frid.	23	2 1 55.22	9.371	12 24 35.7	50.13	1 37.75	0.485	2 3 32.97
Sat.	24	2 5 40.35	9.389	12 44 32.7	49.61	1 49.17	0.466	2 7 29.53
SUN.	25	2 9 25.94	9.408	13 4 17.0	+49.07	2 0.14	0.447	2 11 26.08
Mon.	26	2 13 11.98	9.428	13 23 48.3	48.52	2 10.65	0.428	2 15 22.63
Tues.	27	2 16 58.50	9.448	13 43 6.3	47.97	2 20.69	0.408	2 19 19.19
Wed.	28	2 20 45.51	9.469	14 2 10.7	+47.39	2 30.24	0.388	2 23 15.74
Thur.	29	2 24 33.01	9.490	14 21 1.2	46.80	2 39.29	0.367	2 27 12.30
Frid.	30	2 28 21.02	9.511	14 39 37.4	46.20	2 47.84	0.346	2 31 8.85
Sat.	31	2 32 9.53	9.532	N. 14 57 58.9	+45.59	2 55.88	0.324	2 35 5.41

Note.—The semidiameter for mean noon may be assumed the same as that for apparent noon. The sign + prefixed to the hourly change of declination indicates that north declinations are increasing.

Diff. for 1 Hour, $+9^s.8565$. (Table III.)

AT GREENWICH MEAN NOON.

Day of the Month.	Day of the Year.	THE SUN'S TRUE LONGITUDE. λ	THE SUN'S TRUE LONGITUDE. λ′	Diff. for 1 Hour.	LATITUDE.	Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.
		° ′ ″	′ ″	″	″			h m s
1	91	11 7 43.2	7 48.0	147.89	+ 0.58	9.999 8435	+ 51.4	23 19 21.33
2	92	12 6 51.4	6 56.2	147.80	0.63	9.999 9670	51.5	23 15 25.43
3	93	13 5 57.5	6 2.1	147.71	0.65	0.000 0908	51.7	23 11 29.52
4	94	14 5 1.3	5 5.8	147.62	+ 0.64	0.000 2150	+ 51.8	23 7 33.61
5	95	15 4 3.1	4 7.5	147.53	0.62	0.000 3396	52.0	23 3 37.70
6	96	16 3 2.8	3 7.1	147.44	0.57	0.000 4646	52.1	22 59 41.80
7	97	17 2 0.5	2 4.7	147.36	+ 0.50	0.000 5898	+ 52.2	22 55 45.89
8	98	18 0 56.3	1 0.4	147.28	0.39	0.000 7154	52.3	22 51 49.98
9	99	18 59 50.1	59 54.1	147.21	0.28	0.000 8411	52.4	22 47 54.08
10	100	19 58 42.2	58 46.0	147.13	+ 0.15	0.000 9670	+ 52.4	22 43 58.17
11	101	20 57 32.4	57 36.2	147.06	+ 0.01	0.001 0929	52.4	22 40 2.26
12	102	21 56 20.9	56 24.6	146.99	— 0.10	0.001 2187	52.3	22 36 6.35
13	103	22 55 7.7	55 11.3	146.92	— 0.21	0.001 3441	+ 52.2	22 32 10.44
14	104	23 53 52.8	53 56.2	146.85	0.31	0.001 4691	52.0	22 28 14.54
15	105	24 52 36.2	52 39.6	146.78	0.36	0.001 5935	51.6	22 24 18.63
16	106	25 51 18.0	51 21.2	146.71	— 0.41	0.001 7170	+ 51.2	22 20 22.72
17	107	26 49 58.1	50 1.2	146.63	0.41	0.001 8396	50.8	22 16 26.81
18	108	27 48 36.4	48 39.4	146.56	0.39	0.001 9611	50.3	22 12 30.90
19	109	28 47 12.9	47 15.8	146.48	— 0.33	0.002 0813	+ 49.8	22 8 35.00
20	110	29 45 47.6	45 50.3	146.40	0.24	0.002 2001	49.3	22 4 39.09
21	111	30 44 20.3	44 22.9	146.32	— 0.12	0.002 3175	48.7	22 0 43.18
22	112	31 42 51.0	42 53.5	146.24	+ 0.01	0.002 4336	+ 48.1	21 56 47.27
23	113	32 41 19.7	41 22.1	146.15	0.14	0.002 5483	47.6	21 52 51.36
24	114	33 39 46.2	39 48.5	146.07	0.28	0.002 6618	47.1	21 48 55.45
25	115	34 38 10.7	38 12.9	145.98	+ 0.41	0.002 7741	+ 46.6	21 44 59.55
26	116	35 36 33.1	36 35.1	145.89	0.53	0.002 8854	46.2	21 41 3.64
27	117	36 34 53.3	34 55.2	145.80	0.63	0.002 9956	45.8	21 37 7.73
28	118	37 33 11.5	33 13.3	145.71	+ 0.71	0.003 1050	+ 45.4	21 33 11.82
29	119	38 31 27.6	31 29.3	145.63	0.76	0.003 2135	45.1	21 29 15.91
30	120	39 29 41.7	29 43.2	145.55	0.79	0.003 3212	44.7	21 25 20.00
31	121	40 27 53.9	27 55.2	145.47	+ 0.78	0.003 4282	+ 44.4	21 21 24.09

Note.—The numbers in column λ correspond to the true equinox of the date; in column λ′ to the mean equinox of January 0ᵈ.0.

Diff. for 1 Hour,
— 9ˢ.8296.
(Table II.)

GREENWICH MEAN TIME.

THE MOON'S

Day of the Month.	SEMIDIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
	′ ″	′ ″	′ ″	″	′ ″	″	h m	m	d
1	14 47.5	14 45.9	54 11.2	− 0.59	54 5.1	− 0.43	9 30.4	1.84	10.7
2	14 44.7	14 44.1	54 1.0	− 0.28	53 58.6	− 0.13	10 13.5	1.76	11.7
3	14 43.9	14 44.2	53 57.9	+ 0.01	53 58.8	+ 0.13	10 54.9	1.70	12.7
4	14 44.8	14 45.8	54 1.2	+ 0.25	54 4.9	+ 0.36	11 35.5	1.68	13.7
5	14 47.2	14 48.9	54 9.9	0.47	54 16.2	0.57	12 16.0	1.70	14.7
6	14 50.9	14 53.2	54 23.6	0.66	54 32.1	0.76	12 57.3	1.75	15.7
7	14 55.9	14 58.8	54 41.8	+ 0.85	54 52.5	+ 0.94	13 40.1	1.83	16.7
8	15 2.0	15 5.6	55 4.4	1.03	55 17.4	1.13	14 25.4	1.95	17.7
9	15 9.4	15 13.6	55 31.5	1.23	55 46.8	1.32	15 13.8	2.08	18.7
10	15 18.1	15 22.8	56 3.3	+ 1.42	56 20.9	+ 1.52	16 5.5	2.22	19.7
11	15 28.0	15 33.4	56 39.7	1.61	56 59.6	1.70	17 0.3	2.34	20.7
12	15 39.1	15 45.0	57 20.5	1.77	57 42.1	1.83	17 57.2	2.40	21.7
13	15 51.1	15 57.2	58 4.4	+ 1.87	58 27.1	+ 1.89	18 55.0	2.40	22.7
14	16 3.4	16 9.5	58 49.8	1.87	59 12.1	1.82	19 52.3	2.36	23.7
15	16 15.3	16 20.8	59 33.5	1.73	59 53.6	1.59	20 48.1	2.29	24.7
16	16 25.7	16 29.9	60 11.7	+ 1.44	60 27.3	+ 1.18	21 42.2	2.23	25.7
17	16 33.4	16 35.9	60 39.9	0.90	60 49.0	+ 0.59	22 35.1	2.19	26.7
18	16 37.2	16 37.5	60 54.1	+ 0.25	60 55.0	− 0.11	23 27.6	2.19	27.7
19	16 36.5	16 34.4	60 51.5	− 0.48	60 43.6	− 0.83	☌	. . .	28.7
20	16 31.1	16 26.7	60 31.4	1.18	60 15.4	1.48	0 20.5	2.22	0.3
21	16 21.4	16 15.2	59 55.8	1.75	59 33.3	1.97	1 14.4	2.28	1.3
22	16 8.5	16 1.3	59 8.5	− 2.13	58 42.1	− 2.25	2 9.8	2.33	2.3
23	15 53.8	15 46.2	58 14.6	2.30	57 46.7	2.31	3 6.2	2.36	3.3
24	15 38.7	15 31.3	57 19.1	2.28	56 52.1	2.19	4 2.6	2.34	4.3
25	15 24.3	15 17.8	56 26.4	− 2.08	56 2.2	− 1.94	4 57.9	2.26	5.3
26	15 11.7	15 6.2	55 39.9	1.77	55 19.7	1.59	5 50.8	2.14	6.3
27	15 1.3	14 57.1	55 1.7	1.39	54 46.2	1.19	6 40.6	2.01	7.3
28	14 53.5	14 50.7	54 33.2	− 0.98	54 22.6	− 0.78	7 27.3	1.88	8.3
29	14 48.5	14 46.9	54 14.6	0.57	54 8.9	− 0.37	8 11.3	1.78	9.3
30	14 46.0	14 45.7	54 5.6	− 0.18	54 4.6	0.00	8 53.2	1.71	10.3
31	14 46.0	14 46.8	54 5.6	+ 0.17	54 8.6	+ 0.32	9 33.9	1.68	11.3
32	14 48.1	14 49.9	54 13.4	+ 0.47	54 19.8	+ 0.60	10 14.2	1.69	12.3

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	THURSDAY 1.					SATURDAY 3.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	9 50 7.82	1.9830	N. 17 55 38.2	8.918	0	11 21 28.52	1.8385	N. 9 37 11.9	11.566
1	9 52 6.68	1.9792	17 46 40.9	8.991	1	11 23 18.77	1.8366	9 25 36.8	11.603
2	9 54 5.32	1.9753	17 37 39.3	9.062	2	11 25 8.91	1.8347	9 13 59.5	11.639
3	9 56 3.72	1.9714	17 28 33.4	9.134	3	11 26 58.93	1.8328	9 2 20.1	11.675
4	9 58 1.89	1.9677	17 19 23.2	9.205	4	11 28 48.84	1.8310	8 50 38.5	11.711
5	9 59 59.84	1.9640	17 10 8.8	9.274	5	11 30 38.65	1.8293	8 38 54.8	11.745
6	10 1 57.57	1.9602	17 0 50.3	9.343	6	11 32 28.35	1.8276	8 27 9.1	11.779
7	10 3 55.07	1.9565	16 51 27.6	9.412	7	11 34 17.96	1.8260	8 15 21.3	11.812
8	10 5 52.35	1.9529	16 42 0.9	9.480	8	11 36 7.47	1.8243	8 3 31.6	11.845
9	10 7 49.41	1.9492	16 32 30.1	9.547	9	11 37 56.88	1.8227	7 51 39.9	11.877
10	10 9 46.26	1.9456	16 22 55.3	9.612	10	11 39 46.20	1.8212	7 39 46.4	11.907
11	10 11 42.89	1.9421	16 13 16.7	9.677	11	11 41 35.43	1.8198	7 27 51.1	11.937
12	10 13 39.31	1.9386	16 3 34.1	9.742	12	11 43 24.58	1.8185	7 15 53.9	11.967
13	10 15 35.52	1.9351	15 53 47.7	9.805	13	11 45 13.65	1.8172	7 3 55.0	11.996
14	10 17 31.52	1.9317	15 43 57.5	9.867	14	11 47 2.64	1.8158	6 51 54.4	12.024
15	10 19 27.32	1.9282	15 34 3.6	9.930	15	11 48 51.55	1.8146	6 39 52.1	12.052
16	10 21 22.91	1.9248	15 24 5.9	9.992	16	11 50 40.39	1.8134	6 27 48.2	12.078
17	10 23 18.30	1.9215	15 14 4.6	10.052	17	11 52 29.16	1.8122	6 15 42.7	12.104
18	10 25 13.49	1.9182	15 3 59.7	10.112	18	11 54 17.86	1.8112	6 3 35.7	12.129
19	10 27 8.48	1.9149	14 53 51.2	10.171	19	11 56 6.50	1.8102	5 51 27.2	12.154
20	10 29 3.28	1.9117	14 43 39.2	10.229	20	11 57 55.08	1.8092	5 39 17.2	12.178
21	10 30 57.89	1.9085	14 33 23.7	10.287	21	11 59 43.60	1.8082	5 27 5.8	12.202
22	10 32 52.30	1.9053	14 23 4.8	10.344	22	12 1 32.07	1.8074	5 14 53.0	12.224
23	10 34 46.53	1.9022	N. 14 12 42.5	10.400	23	12 3 20.49	1.8066	N. 5 2 38.9	12.246
	FRIDAY 2.					SUNDAY 4.			
0	10 36 40.57	1.8992	N. 14 2 16.8	10.455	0	12 5 8.86	1.8058	N. 4 50 23.5	12.267
1	10 38 34.43	1.8961	13 51 47.9	10.509	1	12 6 57.19	1.8051	4 38 6.9	12.287
2	10 40 28.11	1.8931	13 41 15.7	10.563	2	12 8 45.47	1.8044	4 25 49.0	12.307
3	10 42 21.60	1.8902	13 30 40.3	10.617	3	12 10 33.72	1.8038	4 13 30.0	12.327
4	10 44 14.92	1.8872	13 20 1.7	10.669	4	12 12 21.93	1.8032	4 1 9.8	12.345
5	10 46 8.07	1.8845	13 9 20.0	10.721	5	12 14 10.11	1.8028	3 48 48.6	12.362
6	10 48 1.05	1.8816	12 58 35.2	10.772	6	12 15 58.27	1.8024	3 36 26.4	12.379
7	10 49 53.86	1.8788	12 47 47.4	10.822	7	12 17 46.40	1.8019	3 24 3.1	12.396
8	10 51 46.50	1.8760	12 36 56.6	10.872	8	12 19 34.50	1.8016	3 11 38.9	12.411
9	10 53 38.98	1.8733	12 26 2.8	10.920	9	12 21 22.59	1.8014	2 59 13.8	12.425
10	10 55 31.30	1.8707	12 15 6.2	10.968	10	12 23 10.67	1.8012	2 46 47.9	12.439
11	10 57 23.46	1.8681	12 4 6.7	11.016	11	12 24 58.73	1.8009	2 34 21.1	12.453
12	10 59 15.47	1.8656	11 53 4.3	11.062	12	12 26 46.78	1.8008	2 21 53.5	12.466
13	11 1 7.33	1.8631	11 41 59.2	11.108	13	12 28 34.83	1.8007	2 9 25.2	12.478
14	11 2 59.04	1.8606	11 30 51.3	11.153	14	12 30 22.87	1.8007	1 56 56.2	12.489
15	11 4 50.60	1.8581	11 19 40.8	11.197	15	12 32 10.91	1.8007	1 44 26.6	12.499
16	11 6 42.01	1.8557	11 8 27.6	11.241	16	12 33 58.96	1.8009	1 31 56.3	12.509
17	11 8 33.29	1.8535	10 57 11.8	11.284	17	12 35 47.02	1.8010	1 19 25.4	12.518
18	11 10 24.43	1.8512	10 45 53.5	11.327	18	12 37 35.09	1.8012	1 6 54.0	12.527
19	11 12 15.43	1.8489	10 34 32.6	11.368	19	12 39 23.17	1.8015	0 54 22.2	12.534
20	11 14 6.30	1.8468	10 23 9.3	11.409	20	12 41 11.27	1.8018	0 41 50.0	12.541
21	11 15 57.04	1.8447	10 11 43.5	11.450	21	12 42 59.39	1.8022	0 29 17.4	12.547
22	11 17 47.66	1.8426	10 0 15.3	11.490	22	12 44 47.53	1.8026	0 16 44.4	12.552
23	11 19 38.15	1.8405	9 48 44.7	11.528	23	12 46 35.70	1.8031	N. 0 4 11.1	12.557
24	11 21 28.52	1.8385	N. 9 37 11.9	11.566	24	12 48 23.90	1.8037	S. 0 8 22.5	12.562

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

MONDAY 5.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	12 48 23.90	1.8037	S. 0 8 22.5	12.562
1	12 50 12.14	1.8042	0 20 56.3	12.565
2	12 52 0.41	1.8048	0 33 30.3	12.567
3	12 53 48.72	1.8056	0 46 4.4	12.569
4	12 55 37.08	1.8063	0 58 38.6	12.570
5	12 57 25.48	1.8072	1 11 12.8	12.570
6	12 59 13.94	1.8081	1 23 47.0	12.570
7	13 1 2.45	1.8089	1 36 21.2	12.569
8	13 2 51.01	1.8099	1 48 55.3	12.567
9	13 4 39.64	1.8110	2 1 29.2	12.564
10	13 6 28.33	1.8120	2 14 3.0	12.561
11	13 8 17.08	1.8132	2 26 36.5	12.557
12	13 10 5.91	1.8144	2 39 9.8	12.552
13	13 11 54.81	1.8157	2 51 42.8	12.546
14	13 13 43.79	1.8170	3 4 15.4	12.539
15	13 15 32.85	1.8183	3 16 47.6	12.533
16	13 17 21.99	1.8197	3 29 19.3	12.525
17	13 19 11.22	1.8212	3 41 50.5	12.516
18	13 21 0.54	1.8227	3 54 21.2	12.507
19	13 22 49.95	1.8243	4 6 51.3	12.497
20	13 24 39.46	1.8260	4 19 20.8	12.486
21	13 26 29.07	1.8277	4 31 49.6	12.474
22	13 28 18.79	1.8295	4 44 17.7	12.462
23	13 30 8.61	1.8312	S. 4 56 45.0	12.448

TUESDAY 6.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	13 31 58.54	1.8331	S. 5 9 11.5	12.434
1	13 33 48.58	1.8350	5 21 37.1	12.419
2	13 35 38.74	1.8371	5 34 1.8	12.403
3	13 37 29.03	1.8391	5 46 25.5	12.387
4	13 39 19.43	1.8411	5 58 48.2	12.370
5	13 41 9.96	1.8433	6 11 9.9	12.352
6	13 43 0.63	1.8456	6 23 30.5	12.333
7	13 44 51.43	1.8477	6 35 49.9	12.313
8	13 46 42.36	1.8500	6 48 8.1	12.292
9	13 48 33.43	1.8524	7 0 25.0	12.271
10	13 50 24.65	1.8548	7 12 40.6	12.249
11	13 52 16.01	1.8573	7 24 54.9	12.227
12	13 54 7.53	1.8599	7 37 7.8	12.202
13	13 55 59.20	1.8624	7 49 19.2	12.177
14	13 57 51.02	1.8650	8 1 29.1	12.152
15	13 59 43.00	1.8677	8 13 37.5	12.127
16	14 1 35.14	1.8704	8 25 44.3	12.099
17	14 3 27.45	1.8732	8 37 49.4	12.071
18	14 5 19.93	1.8761	8 49 52.8	12.042
19	14 7 12.58	1.8790	9 1 54.5	12.012
20	14 9 5.41	1.8819	9 13 54.3	11.982
21	14 10 58.41	1.8849	9 25 52.3	11.951
22	14 12 51.60	1.8880	9 37 48.4	11.919
23	14 14 44.97	1.8911	9 49 42.6	11.886
24	14 16 38.53	1.8942	S. 10 1 34.7	11.852

WEDNESDAY 7.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	14 16 38.53	1.8942	S. 10 1 34.7	11.852
1	14 18 32.28	1.8974	10 13 24.8	11.817
2	14 20 26.22	1.9007	10 25 12.7	11.781
3	14 22 20.36	1.9040	10 36 58.5	11.745
4	14 24 14.70	1.9074	10 48 42.1	11.707
5	14 26 9.25	1.9108	11 0 23.4	11.669
6	14 28 4.00	1.9142	11 12 2.4	11.630
7	14 29 58.96	1.9177	11 23 39.0	11.589
8	14 31 54.13	1.9213	11 35 13.1	11.548
9	14 33 49.52	1.9250	11 46 44.8	11.507
10	14 35 45.13	1.9287	11 58 13.9	11.463
11	14 37 40.96	1.9323	12 9 40.4	11.420
12	14 39 37.01	1.9361	12 21 4.3	11.376
13	14 41 33.29	1.9399	12 32 25.5	11.330
14	14 43 29.80	1.9437	12 43 43.9	11.283
15	14 45 26.54	1.9477	12 54 59.5	11.236
16	14 47 23.52	1.9516	13 6 12.2	11.187
17	14 49 20.73	1.9556	13 17 22.0	11.138
18	14 51 18.19	1.9597	13 28 28.8	11.087
19	14 53 15.89	1.9637	13 39 32.5	11.036
20	14 55 13.83	1.9678	13 50 33.1	10.984
21	14 57 12.02	1.9720	14 1 30.6	10.932
22	14 59 10.47	1.9762	14 12 24.9	10.877
23	15 1 9.17	1.9805	S. 14 23 15.9	10.822

THURSDAY 8.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	15 3 8.13	1.9847	S. 14 34 3.6	10.767
1	15 5 7.34	1.9891	14 44 47.9	10.709
2	15 7 6.82	1.9935	14 55 28.7	10.652
3	15 9 6.56	1.9979	15 6 6.1	10.593
4	15 11 6.57	2.0024	15 16 39.9	10.532
5	15 13 6.85	2.0069	15 27 10.0	10.472
6	15 15 7.40	2.0114	15 37 36.5	10.410
7	15 17 8.22	2.0160	15 47 59.2	10.347
8	15 19 9.32	2.0207	15 58 18.1	10.283
9	15 21 10.70	2.0253	16 8 33.2	10.218
10	15 23 12.36	2.0300	16 18 44.3	10.152
11	15 25 14.30	2.0347	16 28 51.5	10.086
12	15 27 16.52	2.0394	16 38 54.6	10.017
13	15 29 19.03	2.0442	16 48 53.6	9.949
14	15 31 21.83	2.0491	16 58 48.5	9.879
15	15 33 24.92	2.0539	17 8 39.1	9.807
16	15 35 28.30	2.0588	17 18 25.4	9.736
17	15 37 31.98	2.0638	17 28 7.4	9.663
18	15 39 35.96	2.0687	17 37 45.0	9.589
19	15 41 40.23	2.0737	17 47 18.1	9.514
20	15 43 44.80	2.0787	17 56 46.7	9.438
21	15 45 49.67	2.0837	18 6 10.7	9.361
22	15 47 54.84	2.0887	18 15 30.0	9.282
23	15 50 0.31	2.0937	18 24 44.6	9.203
24	15 52 6.09	2.0989	S. 18 33 54.4	9.123

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	FRIDAY 9.					SUNDAY 11.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	15 52 6.09	2.0989	S. 18 33 54.4	9.123	0	17 38 50.52	2.3442	S. 23 59 22.8	4.042
1	15 54 12.18	2.1040	18 42 59.4	9.042	1	17 41 11.31	2.3487	24 3 21.4	3.911
2	15 56 18.57	2.1091	18 51 59.4	8.959	2	17 43 32.37	2.3532	24 7 12.1	3.779
3	15 58 25.27	2.1143	19 0 54.5	8.876	3	17 45 53.69	2.3575	24 10 54.9	3.647
4	16 0 32.28	2.1195	19 9 44.5	8.792	4	17 48 15.27	2.3618	24 14 29.8	3.515
5	16 2 39.60	2.1247	19 18 29.5	8.707	5	17 50 37.11	2.3662	24 17 56.7	3.382
6	16 4 47.24	2.1299	19 27 9.3	8.620	6	17 52 59.21	2.3704	24 21 15.6	3.247
7	16 6 55.19	2.1351	19 35 43.8	8.532	7	17 55 21.56	2.3745	24 24 26.3	3.111
8	16 9 3.45	2.1403	19 44 13.1	8.443	8	17 57 44.15	2.3786	24 27 28.9	2.975
9	16 11 12.03	2.1456	19 52 37.0	8.353	9	18 0 6.99	2.3827	24 30 23.3	2.837
10	16 13 20.92	2.1508	20 0 55.5	8.263	10	18 2 30.07	2.3867	24 33 9.4	2.700
11	16 15 30.13	2.1561	20 9 8.6	8.171	11	18 4 53.39	2.3906	24 35 47.3	2.562
12	16 17 39.65	2.1614	20 17 16.1	8.078	12	18 7 16.94	2.3944	24 38 16.8	2.422
13	16 19 49.49	2.1667	20 25 18.0	7.983	13	18 9 40.72	2.3982	24 40 37.9	2.282
14	16 21 59.65	2.1720	20 33 14.2	7.888	14	18 12 4.72	2.4018	24 42 50.6	2.141
15	16 24 10.13	2.1772	20 41 4.6	7.792	15	18 14 28.94	2.4054	24 44 54.8	1.999
16	16 26 20.92	2.1825	20 48 49.3	7.695	16	18 16 53.37	2.4090	24 46 50.5	1.857
17	16 28 32.03	2.1878	20 56 28.1	7.597	17	18 19 18.02	2.4125	24 48 37.6	1.714
18	16 30 43.46	2.1931	21 4 1.0	7.498	18	18 21 42.88	2.4159	24 50 16.1	1.570
19	16 32 55.21	2.1984	21 11 27.9	7.397	19	18 24 7.94	2.4192	24 51 46.0	1.426
20	16 35 7.27	2.2037	21 18 48.7	7.296	20	18 26 33.19	2.4225	24 53 7.2	1.281
21	16 37 19.65	2.2090	21 26 3.4	7.194	21	18 28 58.63	2.4257	24 54 19.7	1.136
22	16 39 32.35	2.2143	21 33 12.0	7.091	22	18 31 24.27	2.4288	24 55 23.5	0.990
23	16 41 45.37	2.2196	S. 21 40 14.4	6.986	23	18 33 50.09	2.4318	S. 24 56 18.5	0.843
	SATURDAY 10.					MONDAY 12.			
0	16 43 58.70	2.2248	S. 21 47 10.4	6.880	0	18 36 16.08	2.4347	S. 24 57 4.6	0.695
1	16 46 12.35	2.2301	21 54 0.0	6.773	1	18 38 42.25	2.4375	24 57 41.9	0.547
2	16 48 26.31	2.2353	22 0 43.2	6.666	2	18 41 8.58	2.4402	24 58 10.3	0.399
3	16 50 40.59	2.2405	22 7 19.9	6.557	3	18 43 35.08	2.4429	24 58 29.8	0.250
4	16 52 55.18	2.2457	22 13 50.1	6.448	4	18 46 1.73	2.4455	24 58 40.3	−0.101
5	16 55 10.08	2.2509	22 20 13.7	6.337	5	18 48 28.54	2.4481	24 58 41.9	+0.049
6	16 57 25.29	2.2561	22 26 30.5	6.225	6	18 50 55.50	2.4505	24 58 34.4	0.200
7	16 59 40.81	2.2612	22 32 40.6	6.112	7	18 53 22.60	2.4527	24 58 17.9	0.350
8	17 1 56.64	2.2664	22 38 43.9	5.998	8	18 55 49.83	2.4549	24 57 52.4	0.501
9	17 4 12.78	2.2716	22 44 40.4	5.883	9	18 58 17.19	2.4571	24 57 17.8	0.653
10	17 6 29.23	2.2767	22 50 29.9	5.767	10	19 0 44.68	2.4592	24 56 34.0	0.805
11	17 8 45.98	2.2817	22 56 12.5	5.650	11	19 3 12.29	2.4612	24 55 41.1	0.957
12	17 11 3.03	2.2867	23 1 48.0	5.532	12	19 5 40.02	2.4631	24 54 39.1	1.110
13	17 13 20.38	2.2917	23 7 16.4	5.413	13	19 8 7.86	2.4648	24 53 27.9	1.263
14	17 15 38.03	2.2967	23 12 37.6	5.293	14	19 10 35.80	2.4664	24 52 7.6	1.416
15	17 17 55.98	2.3016	23 17 51.6	5.172	15	19 13 3.83	2.4680	24 50 38.0	1.570
16	17 20 14.23	2.3065	23 22 58.3	5.050	16	19 15 31.96	2.4696	24 48 59.2	1.723
17	17 22 32.77	2.3114	23 27 57.6	4.927	17	19 18 0.18	2.4710	24 47 11.2	1.877
18	17 24 51.60	2.3162	23 32 49.6	4.804	18	19 20 28.48	2.4723	24 45 13.9	2.031
19	17 27 10.71	2.3209	23 37 34.1	4.679	19	19 22 56.86	2.4735	24 43 7.4	2.185
20	17 29 30.11	2.3257	23 42 11.1	4.553	20	19 25 25.30	2.4746	24 40 51.6	2.340
21	17 31 49.80	2.3304	23 46 40.5	4.427	21	19 27 53.81	2.4757	24 38 26.6	2.495
22	17 34 9.76	2.3350	23 51 2.3	4.299	22	19 30 22.38	2.4767	24 35 52.3	2.649
23	17 36 30.00	2.3397	23 55 16.4	4.171	23	19 32 51.01	2.4775	24 33 8.7	2.804
24	17 38 50.52	2.3442	S. 23 59 22.8	4.042	24	19 35 19.68	2.4782	S. 24 30 15.8	2.959

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	TUESDAY 13.					THURSDAY 15.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	19 35 19.68	2.4782	S. 24 30 15.8	2.959	0	21 33 36.32	2.4242	S. 19 14 18.6	10.005
1	19 37 48.40	2.4789	24 27 13.6	3.114	1	21 36 1.70	2.4218	19 4 14.4	10.135
2	19 40 17.15	2.4795	24 24 2.1	3.269	2	21 38 26.94	2.4193	18 54 2.4	10.263
3	19 42 45.94	2.4800	24 20 41.3	3.424	3	21 40 52.02	2.4167	18 43 42.8	10.390
4	19 45 14.75	2.4803	24 17 11.2	3.578	4	21 43 16.95	2.4142	18 33 15.6	10.517
5	19 47 43.58	2.4807	24 13 31.9	3.733	5	21 45 41.73	2.4117	18 22 40.8	10.642
6	19 50 12.43	2.4809	24 9 43.2	3.888	6	21 48 6.36	2.4092	18 11 58.6	10.766
7	19 52 41.29	2.4811	24 5 45.3	4.042	7	21 50 30.83	2.4066	18 1 8.9	10.890
8	19 55 10.16	2.4812	24 1 38.1	4.197	8	21 52 55.15	2.4040	17 50 11.8	11.012
9	19 57 39.03	2.4811	23 57 21.7	4.351	9	21 55 19.31	2.4013	17 39 7.5	11.132
10	20 0 7.89	2.4809	23 52 56.0	4.506	10	21 57 43.31	2.3987	17 27 55.9	11.252
11	20 2 36.74	2.4807	23 48 21.0	4.660	11	22 0 7.16	2.3962	17 16 37.2	11.370
12	20 5 5.57	2.4803	23 43 36.8	4.813	12	22 2 30.85	2.3935	17 5 11.5	11.487
13	20 7 34.38	2.4800	23 38 43.4	4.967	13	22 4 54.38	2.3908	16 53 38.8	11.602
14	20 10 3.17	2.4796	23 33 40.7	5.121	14	22 7 17.75	2.3882	16 41 59.2	11.717
15	20 12 31.93	2.4791	23 28 28.9	5.273	15	22 9 40.96	2.3856	16 30 12.7	11.831
16	20 15 0.66	2.4784	23 23 7.9	5.426	16	22 12 4.02	2.3829	16 18 19.5	11.942
17	20 17 29.34	2.4777	23 17 37.8	5.577	17	22 14 26.91	2.3802	16 6 19.6	12.053
18	20 19 57.98	2.4769	23 11 58.6	5.730	18	22 16 49.65	2.3777	15 54 13.1	12.162
19	20 22 26.57	2.4761	23 6 10.2	5.882	19	22 19 12.23	2.3750	15 42 0.1	12.271
20	20 24 55.11	2.4752	23 0 12.8	6.032	20	22 21 34.65	2.3723	15 29 40.6	12.378
21	20 27 23.59	2.4741	22 54 6.3	6.184	21	22 23 56.91	2.3697	15 17 14.7	12.483
22	20 29 52.00	2.4730	22 47 50.7	6.334	22	22 26 19.01	2.3671	15 4 42.6	12.587
23	20 32 20.35	2.4719	S. 22 41 26.2	6.483	23	22 28 40.96	2.3645	S. 14 52 4.3	12.689
	WEDNESDAY 14.					FRIDAY 16.			
0	20 34 48.63	2.4707	S. 22 34 52.7	6.633	0	22 31 2.75	2.3619	S. 14 39 19.9	12.790
1	20 37 16.83	2.4693	22 28 10.2	6.782	1	22 33 24.39	2.3593	14 26 29.5	12.890
2	20 39 44.95	2.4679	22 21 18.9	6.929	2	22 35 45.87	2.3567	14 13 33.1	12.989
3	20 42 12.98	2.4665	22 14 18.7	7.077	3	22 38 7.20	2.3542	14 0 30.8	13.086
4	20 44 40.93	2.4651	22 7 9.6	7.224	4	22 40 28.38	2.3517	13 47 22.8	13.181
5	20 47 8.79	2.4635	21 59 51.8	7.370	5	22 42 49.41	2.3492	13 34 9.1	13.275
6	20 49 36.55	2.4618	21 52 25.2	7.517	6	22 45 10.29	2.3467	13 20 49.8	13.367
7	20 52 4.21	2.4602	21 44 49.8	7.662	7	22 47 31.02	2.3442	13 7 25.0	13.458
8	20 54 31.77	2.4584	21 37 5.8	7.805	8	22 49 51.60	2.3417	12 53 54.8	13.548
9	20 56 59.22	2.4567	21 29 13.2	7.949	9	22 52 12.03	2.3393	12 40 19.2	13.637
10	20 59 26.57	2.4548	21 21 11.9	8.092	10	22 54 32.32	2.3370	12 26 38.4	13.722
11	21 1 53.80	2.4529	21 13 2.1	8.234	11	22 56 52.47	2.3347	12 12 52.5	13.807
12	21 4 20.92	2.4510	21 4 43.8	8.376	12	22 59 12.48	2.3323	11 59 1.5	13.891
13	21 6 47.92	2.4490	20 56 17.0	8.517	13	23 1 32.35	2.3300	11 45 5.6	13.972
14	21 9 14.80	2.4469	20 47 41.8	8.657	14	23 3 52.08	2.3277	11 31 4.8	14.053
15	21 11 41.55	2.4447	20 38 58.2	8.795	15	23 6 11.67	2.3254	11 16 59.2	14.132
16	21 14 8.17	2.4427	20 30 6.4	8.932	16	23 8 31.13	2.3232	11 2 49.0	14.208
17	21 16 34.67	2.4405	20 21 6.3	9.071	17	23 10 50.46	2.3211	10 48 34.2	14.284
18	21 19 1.03	2.4382	20 11 57.9	9.207	18	23 13 9.66	2.3190	10 34 14.9	14.358
19	21 21 27.26	2.4360	20 2 41.4	9.342	19	23 15 28.74	2.3169	10 19 51.2	14.431
20	21 23 53.35	2.4337	19 53 16.8	9.477	20	23 17 47.69	2.3147	10 5 23.2	14.501
21	21 26 19.31	2.4314	19 43 44.2	9.610	21	23 20 6.51	2.3127	9 50 51.1	14.570
22	21 28 45.12	2.4290	19 34 3.6	9.743	22	23 22 25.22	2.3108	9 36 14.8	14.637
23	21 31 10.79	2.4267	19 24 15.0	9.875	23	23 24 43.81	2.3088	9 21 34.6	14.702
24	21 33 36.32	2.4242	S. 19 14 18.6	10.005	24	23 27 2.28	2.3069	S. 9 6 50.5	14.767

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	SATURDAY 17.					MONDAY 19.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	23 27 2.28	2.3069	S. 9 6 50.5	14.767	0	1 16 32.03	2.2762	N. 3 22 17.4	15.752
1	23 29 20.64	2.3051	8 52 2.6	14.829	1	1 18 48.62	2.2769	3 38 1.8	15.728
2	23 31 38.89	2.3032	8 37 11.0	14.889	2	1 21 5.26	2.2777	3 53 44.7	15.701
3	23 33 57.03	2.3015	8 22 15.9	14.948	3	1 23 21.95	2.2785	4 9 25.9	15.672
4	23 36 15.07	2.2998	8 7 17.2	15.006	4	1 25 38.68	2.2793	4 25 5.4	15.643
5	23 38 33.01	2.2982	7 52 15.2	15.061	5	1 27 55.47	2.2802	4 40 43.1	15.612
6	23 40 50.85	2.2965	7 37 9.9	15.115	6	1 30 12.31	2.2812	4 56 18.8	15.578
7	23 43 8.59	2.2949	7 22 1.4	15.167	7	1 32 29.22	2.2823	5 11 52.5	15.543
8	23 45 26.24	2.2933	7 6 49.9	15.217	8	1 34 46.19	2.2833	5 27 24.0	15.507
9	23 47 43.79	2.2918	6 51 35.4	15.266	9	1 37 3.22	2.2844	5 42 53.3	15.468
10	23 50 1.26	2.2905	6 36 18.0	15.312	10	1 39 20.32	2.2856	5 58 20.2	15.427
11	23 52 18.65	2.2891	6 20 57.9	15.357	11	1 41 37.49	2.2868	6 13 44.6	15.384
12	23 54 35.95	2.2877	6 5 35.1	15.401	12	1 43 54.73	2.2880	6 29 6.4	15.341
13	23 56 53.17	2.2864	5 50 9.8	15.442	13	1 46 12.05	2.2893	6 44 25.4	15.294
14	23 59 10.32	2.2852	5 34 42.0	15.482	14	1 48 29.45	2.2907	6 59 41.6	15.247
15	0 1 27.40	2.2841	5 19 11.9	15.520	15	1 50 46.93	2.2921	7 14 55.0	15.197
16	0 3 44.41	2.2829	5 3 39.6	15.557	16	1 53 4.49	2.2935	7 30 5.3	15.145
17	0 6 1.35	2.2818	4 48 5.2	15.591	17	1 55 22.14	2.2950	7 45 12.4	15.092
18	0 8 18.23	2.2808	4 32 28.7	15.623	18	1 57 39.89	2.2965	8 0 16.3	15.038
19	0 10 35.05	2.2799	4 16 50.3	15.654	19	1 59 57.73	2.2981	8 15 16.9	14.982
20	0 12 51.82	2.2790	4 1 10.2	15.683	20	2 2 15.66	2.2996	8 30 14.1	14.923
21	0 15 8.53	2.2782	3 45 28.4	15.710	21	2 4 33.69	2.3012	8 45 7.7	14.862
22	0 17 25.20	2.2774	3 29 45.0	15.736	22	2 6 51.81	2.3029	8 59 57.6	14.801
23	0 19 41.82	2.2766	S. 3 14 0.1	15.760	23	2 9 10.03	2.3046	N. 9 14 43.8	14.738
	SUNDAY 18.					TUESDAY 20.			
0	0 21 58.39	2.2758	S. 2 58 13.8	15.782	0	2 11 28.36	2.3064	N. 9 29 26.2	14.672
1	0 24 14.92	2.2752	2 42 26.3	15.801	1	2 13 46.80	2.3082	9 44 4.5	14.605
2	0 26 31.42	2.2747	2 26 37.7	15.819	2	2 16 5.34	2.3100	9 58 38.8	14.537
3	0 28 47.89	2.2742	2 10 48.0	15.836	3	2 18 23.99	2.3118	10 13 9.0	14.467
4	0 31 4.32	2.2737	1 54 57.4	15.850	4	2 20 42.75	2.3137	10 27 34.9	14.395
5	0 33 20.73	2.2733	1 39 6.0	15.862	5	2 23 1.63	2.3156	10 41 56.4	14.322
6	0 35 37.12	2.2730	1 23 13.9	15.873	6	2 25 20.62	2.3175	10 56 13.5	14.247
7	0 37 53.49	2.2727	1 7 21.2	15.882	7	2 27 39.73	2.3195	11 10 26.0	14.169
8	0 40 9.84	2.2724	0 51 28.0	15.889	8	2 29 58.96	2.3214	11 24 33.8	14.091
9	0 42 26.18	2.2722	0 35 34.5	15.894	9	2 32 18.30	2.3234	11 38 36.9	14.012
10	0 44 42.51	2.2721	0 19 40.7	15.897	10	2 34 37.77	2.3255	11 52 35.2	13.930
11	0 46 58.83	2.2720	S. 0 3 46.8	15.899	11	2 36 57.36	2.3275	12 6 28.5	13.847
12	0 49 15.15	2.2720	N. 0 12 7.2	15.899	12	2 39 17.07	2.3296	12 20 16.8	13.762
13	0 51 31.47	2.2721	0 28 1.1	15.897	13	2 41 36.91	2.3317	12 34 0.0	13.676
14	0 53 47.80	2.2722	0 43 54.8	15.892	14	2 43 56.88	2.3338	12 47 37.9	13.587
15	0 56 4.13	2.2723	0 59 48.2	15.887	15	2 46 16.98	2.3360	13 1 10.5	13.497
16	0 58 20.47	2.2725	1 15 41.2	15.879	16	2 48 37.20	2.3382	13 14 37.6	13.407
17	1 0 36.83	2.2728	1 31 33.7	15.870	17	2 50 57.55	2.3402	13 27 59.3	13.315
18	1 2 53.21	2.2732	1 47 25.6	15.858	18	2 53 18.03	2.3424	13 41 15.4	13.221
19	1 5 9.61	2.2735	2 3 16.7	15.845	19	2 55 38.64	2.3446	13 54 25.8	13.126
20	1 7 26.03	2.2739	2 19 7.0	15.830	20	2 57 59.38	2.3468	14 7 30.5	13.029
21	1 9 42.48	2.2744	2 34 56.3	15.813	21	3 0 20.26	2.3490	14 20 29.3	12.930
22	1 11 58.96	2.2750	2 50 44.5	15.794	22	3 2 41.27	2.3512	14 33 22.1	12.831
23	1 14 15.48	2.2756	3 6 31.6	15.773	23	3 5 2.41	2.3535	14 46 9.0	12.730
24	1 16 32.03	2.2762	N. 3 22 17.4	15.752	24	3 7 23.69	2.3557	N. 14 58 49.7	12.627

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.			Diff. for 1 Minute.	Declination.			Diff. for 1 Minute.
WEDNESDAY 21.								
	h	m	s	s	°	′	″	″
0	3	7	23.69	2.3557	N.14	58	49.7	12.627
1	3	9	45.10	2.3579	15	11	24.2	12.522
2	3	12	6.64	2.3602	15	23	52.4	12.417
3	3	14	28.32	2.3624	15	36	14.3	12.312
4	3	16	50.13	2.3646	15	48	29.8	12.203
5	3	19	12.07	2.3667	16	0	38.7	12.093
6	3	21	34.14	2.3689	16	12	41.0	11.982
7	3	23	56.34	2.3712	16	24	36.6	11.871
8	3	26	18.68	2.3734	16	36	25.5	11.757
9	3	28	41.15	2.3755	16	48	7.5	11.643
10	3	31	3.74	2.3777	16	59	42.7	11.528
11	3	33	26.47	2.3798	17	11	10.9	11.411
12	3	35	49.32	2.3819	17	22	32.0	11.292
13	3	38	12.30	2.3841	17	33	46.0	11.173
14	3	40	35.41	2.3862	17	44	52.8	11.053
15	3	42	58.65	2.3883	17	55	52.4	10.932
16	3	45	22.01	2.3902	18	6	44.6	10.808
17	3	47	45.48	2.3922	18	17	29.4	10.685
18	3	50	9.08	2.3943	18	28	6.8	10.561
19	3	52	32.80	2.3963	18	38	36.7	10.435
20	3	54	56.64	2 3982	18	48	59.0	10.307
21	3	57	20.59	2.4001	18	59	13.6	10.179
22	3	59	44.65	2.4020	19	9	20.5	10.051
23	4	2	8.83	2.4038	N.19	19	19.7	9.922
THURSDAY 22.								
0	4	4	33.11	2.4056	N.19	29	11.1	9.790
1	4	6	57.50	2.4073	19	38	54.5	9.657
2	4	9	21.99	2.4091	19	48	30.0	9.526
3	4	11	46.59	2.4108	19	57	57.6	9.392
4	4	14	11.29	2.4124	20	7	17.1	9.257
5	4	16	36.08	2.4139	20	16	28.5	9.122
6	4	19	0.96	2.4155	20	25	31.7	8.986
7	4	21	25.94	2.4170	20	34	26.8	8.849
8	4	23	51.00	2.4184	20	43	13.6	8.711
9	4	26	16.15	2.4198	20	51	52.1	8.572
10	4	28	41.38	2.4212	21	0	22.3	8.434
11	4	31	6.69	2.4224	21	8	44.2	8.294
12	4	33	32.07	2.4237	21	16	57.6	8.153
13	4	35	57.53	2.4248	21	25	2.6	8.012
14	4	38	23.05	2.4259	21	32	59.1	7.871
15	4	40	48.64	2.4270	21	40	47.1	7.728
16	4	43	14.29	2.4279	21	48	26.5	7.585
17	4	45	39.99	2.4288	21	55	57.3	7.442
18	4	48	5.75	2.4297	22	3	19.5	7.298
19	4	50	31.56	2.4305	22	10	33.1	7.153
20	4	52	57.41	2.4312	22	17	38.0	7.008
21	4	55	23.31	2.4319	22	24	34.1	6.863
22	4	57	49.24	2.4325	22	31	21.5	6.717
23	5	0	15.21	2.4330	22	38	0.1	6.571
24	5	2	41.20	2.4334	N.22	44	30.0	6.424

Hour.	Right Ascension.			Diff. for 1 Minute.	Declination.			Diff. for 1 Minute.
FRIDAY 23.								
	h	m	s	s	°	′	″	″
0	5	2	41.20	2.4334	N.22	44	30.0	6.424
1	5	5	7.22	2.4338	22	50	51.0	6.277
2	5	7	33.26	2.4341	22	57	3.2	6.130
3	5	9	59.31	2.4342	23	3	6.5	5.982
4	5	12	25.37	2.4344	23	9	1.0	5.833
5	5	14	51.44	2.4345	23	14	46.6	5.685
6	5	17	17.51	2.4344	23	20	23.3	5.537
7	5	19	43.57	2.4343	23	25	51.0	5.388
8	5	22	9.63	2.4342	23	31	9.8	5.239
9	5	24	35.68	2.4340	23	36	19.7	5.090
10	5	27	1.71	2.4336	23	41	20.6	4.940
11	5	29	27.71	2.4332	23	46	12.5	4.791
12	5	31	53.69	2.4327	23	50	55.5	4.642
13	5	34	19.63	2.4321	23	55	29.5	4.492
14	5	36	45.54	2.4315	23	59	54.5	4.342
15	5	39	11.41	2.4307	24	4	10.5	4.192
16	5	41	37.23	2.4298	24	8	17.6	4.042
17	5	44	2.99	2.4289	24	12	15.6	3.892
18	5	46	28.70	2.4279	24	16	4.7	3.743
19	5	48	54.34	2.4268	24	19	44.8	3.593
20	5	51	19.92	2.4257	24	23	15.9	3.443
21	5	53	45.42	2.4244	24	26	38.0	3.294
22	5	56	10.85	2.4232	24	29	51.2	3.145
23	5	58	36.20	2.4217	N.24	32	55.4	2.996
SATURDAY 24.								
0	6	1	1.45	2.4201	N.24	35	50.7	2.847
1	6	3	26.61	2.4186	24	38	37.1	2.698
2	6	5	51.68	2.4169	24	41	14.5	2.549
3	6	8	16.64	2.4151	24	43	43.0	2.402
4	6	10	41.49	2.4132	24	46	2.7	2.253
5	6	13	6.23	2.4113	24	48	13.4	2.105
6	6	15	30.85	2.4093	24	50	15.3	1.958
7	6	17	55.35	2.4072	24	52	8.4	1.811
8	6	20	19.72	2.4051	24	53	52.6	1.664
9	6	22	43.96	2.4028	24	55	28.1	1.518
10	6	25	8.06	2.4004	24	56	54.8	1.372
11	6	27	32.01	2.3980	24	58	12.7	1.225
12	6	29	55.82	2.3956	24	59	21.8	1.079
13	6	32	19.48	2.3930	25	0	22.2	0.935
14	6	34	42.98	2.3902	25	1	14.0	0.791
15	6	37	6.31	2.3875	25	1	57.1	0.646
16	6	39	29.48	2.3847	25	2	31.5	0.502
17	6	41	52.48	2.3818	25	2	57.4	0.360
18	6	44	15.30	2.3788	25	3	14.7	0.217
19	6	46	37.94	2.3758	25	3	23.5	+0.076
20	6	49	0.40	2.3727	25	3	23.8	−0.066
21	6	51	22.66	2.3695	25	3	15.6	0.207
22	6	53	44.74	2.3662	25	2	59.0	0.347
23	6	56	6.61	2.3628	25	2	34.0	0.487
24	6	58	28.28	2.3595	N.25	2	0.6	0.626

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	SUNDAY 25.			
	h m s	s	° ′ ″	″
0	6 58 28.28	2.3595	N.25 2 0.6	0.626
1	7 0 49.75	2.3560	25 1 18.9	0.764
2	7 3 11.00	2.3525	25 0 28.9	0.902
3	7 5 32.04	2.3489	24 59 30.6	1.040
4	7 7 52.87	2.3452	24 58 24.1	1.176
5	7 10 13.47	2.3414	24 57 9.5	1.311
6	7 12 33.84	2.3376	24 55 46.8	1.447
7	7 14 53.99	2.3338	24 54 16.0	1.582
8	7 17 13.90	2.3299	24 52 37.1	1.715
9	7 19 33.58	2.3260	24 50 50.2	1.847
10	7 21 53.02	2.3219	24 48 55.3	1.980
11	7 24 12.21	2.3178	24 46 52.5	2.112
12	7 26 31.16	2.3137	24 44 41.9	2.242
13	7 28 49.86	2.3095	24 42 23.5	2.372
14	7 31 8.30	2.3052	24 39 57.2	2.502
15	7 33 26.49	2.3010	24 37 23.3	2.630
16	7 35 44.42	2.2967	24 34 41.6	2.758
17	7 38 2.09	2.2923	24 31 52.3	2.885
18	7 40 19.50	2.2879	24 28 55.4	3.011
19	7 42 36.64	2.2834	24 25 51.0	3.136
20	7 44 53.51	2.2788	24 22 39.1	3.260
21	7 47 10.10	2.2743	24 19 19.8	3.384
22	7 49 26.43	2.2698	24 15 53.0	3.507
23	7 51 42.48	2.2652	N.24 12 18.9	3.629
	MONDAY 26.			
0	7 53 58.25	2.2605	N.24 8 37.5	3.751
1	7 56 13.74	2.2558	24 4 48.8	3.871
2	7 58 28.95	2.2511	24 0 53.0	3.989
3	8 0 43.87	2.2462	23 56 50.1	4.108
4	8 2 58.50	2.2415	23 52 40.0	4.227
5	8 5 12.85	2.2367	23 48 22.9	4.343
6	8 7 26.91	2.2319	23 43 58.9	4.458
7	8 9 40.68	2.2270	23 39 27.9	4.574
8	8 11 54.15	2.2221	23 34 50.0	4.688
9	8 14 7.33	2.2172	23 30 5.3	4.802
10	8 16 20.22	2.2123	23 25 13.8	4.914
11	8 18 32.81	2.2074	23 20 15.6	5.025
12	8 20 45.11	2.2025	23 15 10.8	5.136
13	8 22 57.11	2.1975	23 9 59.3	5.246
14	8 25 8.81	2.1924	23 4 41.3	5.354
15	8 27 20.20	2.1874	22 59 16.8	5.462
16	8 29 31.30	2.1825	22 53 45.9	5.568
17	8 31 42.10	2.1775	22 48 8.6	5.675
18	8 33 52.60	2.1725	22 42 24.9	5.781
19	8 36 2.80	2.1674	22 36 34.9	5.885
20	8 38 12.69	2.1623	22 30 38.7	5.988
21	8 40 22.28	2.1573	22 24 36.3	6.091
22	8 42 31.57	2.1523	22 18 27.8	6.192
23	8 44 40.56	2.1473	22 12 13.2	6.293
24	8 46 49.25	2.1422	N.22 5 52.6	6.393

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	TUESDAY 27.			
	h m s	s	° ′ ″	″
0	8 46 49.25	2.1422	N.22 5 52.6	6.393
1	8 48 57.63	2.1372	21 59 26.0	6.492
2	8 51 5.71	2.1322	21 52 53.6	6.589
3	8 53 13.50	2.1272	21 46 15.3	6.687
4	8 55 20.98	2.1222	21 39 31.2	6.783
5	8 57 28.16	2.1172	21 32 41.3	6.879
6	8 59 35.04	2.1122	21 25 45.7	6.973
7	9 1 41.62	2.1072	21 18 44.5	7.067
8	9 3 47.90	2.1022	21 11 37.7	7.159
9	9 5 53.88	2.0972	21 4 25.4	7.251
10	9 7 59.57	2.0923	20 57 7.6	7.341
11	9 10 4.96	2.0873	20 49 44.5	7.431
12	9 12 10.05	2.0824	20 42 15.9	7.521
13	9 14 14.85	2.0775	20 34 42.0	7.609
14	9 16 19.35	2.0727	20 27 2.8	7.696
15	9 18 23.57	2.0678	20 19 18.5	7.782
16	9 20 27.49	2.0629	20 11 29.0	7.868
17	9 22 31.12	2.0581	20 3 34.3	7.953
18	9 24 34.46	2.0533	19 55 34.6	8.037
19	9 26 37.52	2.0486	19 47 29.9	8.119
20	9 28 40.29	2.0438	19 39 20.3	8.201
21	9 30 42.78	2.0392	19 31 5.8	8.282
22	9 32 44.99	2.0344	19 22 46.4	8.363
23	9 34 46.91	2.0297	N.19 14 22.2	8.442
	WEDNESDAY 28.			
0	9 36 48.56	2.0252	N.19 5 53.3	8.521
1	9 38 49.93	2.0206	18 57 19.7	8.599
2	9 40 51.03	2.0160	18 48 41.4	8.676
3	9 42 51.85	2.0114	18 39 58.6	8.752
4	9 44 52.40	2.0069	18 31 11.2	8.827
5	9 46 52.68	2.0024	18 22 19.3	8.902
6	9 48 52.69	1.9980	18 13 22.9	8.976
7	9 50 52.44	1.9936	18 4 22.2	9.048
8	9 52 51.92	1.9892	17 55 17.1	9.121
9	9 54 51.14	1.9849	17 46 7.7	9.192
10	9 56 50.11	1.9807	17 36 54.1	9.262
11	9 58 48.82	1.9763	17 27 36.3	9.332
12	10 0 47.27	1.9721	17 18 14.3	9.401
13	10 2 45.47	1.9679	17 8 48.2	9.468
14	10 4 43.42	1.9638	16 59 18.1	9.536
15	10 6 41.13	1.9597	16 49 43.9	9.602
16	10 8 38.59	1.9557	16 40 5.8	9.667
17	10 10 35.81	1.9517	16 30 23.8	9.732
18	10 12 32.79	1.9477	16 20 37.9	9.797
19	10 14 29.53	1.9437	16 10 48.1	9.861
20	10 16 26.04	1.9399	16 0 54.6	9.923
21	10 18 22.32	1.9361	15 50 57.4	9.984
22	10 20 18.37	1.9322	15 40 56.5	10.046
23	10 22 14.19	1.9285	15 30 51.9	10.106
24	10 24 9.79	1.9248	N.15 20 43.8	10.165

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	THURSDAY 29.			
	h m s	s	° ′ ″	″
0	10 24 9.79	1.9248	N.15 20 43.8	10.165
1	10 26 5.17	1.9212	15 10 32.1	10.224
2	10 28 0.33	1.9176	15 0 16.9	10.282
3	10 29 55.28	1.9140	14 49 58.3	10.338
4	10 31 50.01	1.9104	14 39 36.3	10.395
5	10 33 44.53	1.9070	14 29 10.9	10.451
6	10 35 38.85	1.9037	14 18 42.2	10.506
7	10 37 32.97	1.9002	14 8 10.2	10.561
8	10 39 26.89	1.8969	13 57 34.9	10.614
9	10 41 20.61	1.8937	13 46 56.5	10.667
10	10 43 14.13	1.8905	13 36 14.9	10.719
11	10 45 7.46	1.8873	13 25 30.2	10.770
12	10 47 0.60	1.8842	13 14 42.5	10.821
13	10 48 53.56	1.8811	13 3 51.7	10.871
14	10 50 46.33	1.8781	12 52 58.0	10.919
15	10 52 38.93	1.8752	12 42 1.4	10.968
16	10 54 31.35	1.8722	12 31 1.8	11.017
17	10 56 23.60	1.8694	12 19 59.4	11.063
18	10 58 15.68	1.8666	12 8 54.2	11.109
19	11 0 7.59	1.8638	11 57 46.3	11.155
20	11 1 59.34	1.8612	11 46 35.6	11.201
21	11 3 50.93	1.8585	11 35 22.2	11.245
22	11 5 42.36	1.8559	11 24 6.2	11.288
23	11 7 33.64	1.8534	N.11 12 47.6	11.331
	FRIDAY 30.			
0	11 9 24.77	1.8509	N.11 1 26.5	11.373
1	11 11 15.75	1.8485	10 50 2.8	11.415
2	11 13 6.59	1.8462	10 38 36.7	11.456
3	11 14 57.29	1.8438	10 27 8.1	11.496
4	11 16 47.85	1.8416	10 15 37.2	11.535
5	11 18 38.28	1.8394	10 4 3.9	11.574
6	11 20 28.58	1.8372	9 52 28.3	11.612
7	11 22 18.75	1.8352	9 40 50.4	11.650
8	11 24 8.80	1.8332	9 29 10.3	11.687
9	11 25 58.73	1.8312	9 17 28.0	11.723
10	11 27 48.54	1.8292	9 5 43.5	11.759
11	11 29 38.24	1.8274	8 53 56.9	11.793
12	11 31 27.83	1.8257	8 42 8.3	11.827
13	11 33 17.32	1.8239	8 30 17.6	11.861
14	11 35 6.70	1.8222	8 18 25.0	11.893
15	11 36 55.98	1.8206	8 6 30.4	11.926
16	11 38 45.17	1.8190	7 54 33.9	11.957
17	11 40 34.27	1.8175	7 42 35.5	11.988
18	11 42 23.28	1.8161	7 30 35.3	12.018
19	11 44 12.20	1.8146	7 18 33.3	12.047
20	11 46 1.03	1.8132	7 6 29.6	12.077
21	11 47 49.78	1.8120	6 54 24.1	12.105
22	11 49 38.46	1.8108	6 42 17.0	12.132
23	11 51 27.08	1.8097	6 30 8.2	12.159
24	11 53 15.62	1.8085	N. 6 17 57.9	12.185

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	SATURDAY, MAY 1.			
	h m s	s	° ′ ″	″
0	11 53 15.62	1.8085	N. 6 17 57.9	12.185

PHASES OF THE MOON.

			d	h	m
○	Full Moon	Apr.	5	8	28.4
☾	Last Quarter		13	2	30.2
●	New Moon		19	16	51.3
☽	First Quarter		26	20	36.2

			d	h
☾	Apogee	Apr.	2	22.9
☾	Perigee		18	8.4
☾	Apogee		30	11.9

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh	P. L. of Diff.	VIh	P. L. of Diff.	IXh	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
1	*a* Arietis	W.	106 6 39	3191	107 32 59	3196	108 59 13	3201	110 25 21	3206
	Aldebaran	W.	75 41 10	3074	77 9 51	3077	78 38 29	3080	80 7 3	3082
	Pollux	W.	31 35 27	3097	33 3 40	3096	34 31 54	3096	36 0 8	3097
	Spica	E.	59 15 34	3096	57 47 19	3100	56 19 9	3104	54 51 5	3108
	Antares	E.	105 8 8	3082	103 39 36	3084	102 11 7	3087	100 42 41	3089
2	Aldebaran	W.	87 29 17	3090	88 57 38	3091	90 25 59	3091	91 54 19	3092
	Pollux	W.	43 21 9	3098	44 49 21	3098	46 17 33	3097	47 45 46	3096
	Spica	E.	47 31 50	3126	46 4 12	3129	44 36 38	3132	43 9 8	3135
	Antares	E.	93 21 8	3097	91 52 55	3097	90 24 42	3098	88 56 30	3098
3	Aldebaran	W.	99 15 59	3090	100 44 21	3089	102 12 44	3088	103 41 9	3087
	Pollux	W.	55 7 7	3091	56 35 28	3089	58 3 51	3087	59 32 16	3085
	Regulus	W.	19 19 21	3180	20 45 55	3165	22 12 46	3153	23 39 51	3143
	Spica	E.	35 52 38	3155	34 25 35	3160	32 58 37	3166	31 31 46	3172
	Antares	E.	81 35 28	3096	80 7 14	3095	78 38 58	3094	77 10 41	3093
	a Aquilæ	E.	123 25 34	4223	122 17 30	4186	121 8 50	4150	119 59 36	4115
4	Aldebaran	W.	111 3 43	3076	112 32 22	3073	114 1 4	3071	115 29 49	3068
	Pollux	W.	66 55 4	3072	68 23 48	3069	69 52 35	3066	71 21 26	3062
	Regulus	W.	30 57 59	3104	32 26 4	3098	33 54 16	3092	35 22 36	3086
	JUPITER	W.	23 50 16	3079	25 18 41	3071	26 47 26	3064	28 16 20	3058
	Antares	E.	69 48 47	3083	68 20 16	3081	66 51 43	3078	65 23 6	3075
	a Aquilæ	E.	114 5 56	3978	112 53 55	3955	111 41 31	3934	110 28 46	3915
	MARS	E.	117 9 4	3315	115 45 10	3312	114 21 13	3309	112 57 12	3306
5	Pollux	W.	78 46 49	3043	80 16 8	3039	81 45 32	3035	83 15 1	3030
	Regulus	W.	42 45 57	3059	44 14 57	3053	45 44 3	3048	47 13 17	3043
	JUPITER	W.	35 42 39	3029	37 12 16	3023	38 42 0	3018	40 11 51	3012
	Antares	E.	57 59 13	3061	56 30 16	3058	55 1 14	3055	53 32 9	3052
	a Aquilæ	E.	104 20 19	3831	103 5 49	3817	101 51 4	3804	100 36 6	3793
	MARS	E.	105 56 7	3287	104 31 40	3282	103 7 8	3278	101 42 31	3273
6	Pollux	W.	90 43 53	3006	92 13 58	3001	93 44 9	2996	95 14 26	2991
	Regulus	W.	54 41 6	3015	56 11 0	3009	57 41 2	3003	59 11 11	2997
	JUPITER	W.	47 42 47	2985	49 13 19	2979	50 43 58	2973	52 14 44	2967
	Antares	E.	46 5 44	3035	44 36 15	3032	43 6 42	3029	41 37 5	3026
	a Aquilæ	E.	94 18 31	3745	93 2 32	3738	91 46 25	3732	90 30 12	3726
	MARS	E.	94 37 59	3247	93 12 46	3242	91 47 27	3237	90 22 2	3231
7	Pollux	W.	102 47 38	2962	104 18 39	2956	105 49 47	2950	107 20 3	2944
	Regulus	W.	66 43 50	2966	68 14 45	2959	69 45 49	2953	71 17 1	2946
	JUPITER	W.	59 50 27	2937	61 21 59	2931	62 53 39	2924	64 25 27	2917
	Antares	E.	34 8 16	3016	32 38 23	3016	31 8 30	3016	29 38 37	3017
	MARS	E.	83 13 10	3200	81 47 1	3194	80 20 45	3187	78 54 21	3180
	a Aquilæ	E.	84 7 50	3709	82 51 13	3708	81 34 34	3708	80 17 55	3709
	Fomalhaut	E.	116 39 31	3172	115 12 48	3161	113 45 52	3150	112 18 43	3139
8	Regulus	W.	78 55 11	2911	80 27 16	2903	81 59 31	2895	83 31 56	2583
	JUPITER	W.	72 6 36	2883	73 39 17	2876	75 12 7	2868	76 45 7	2861
	Spica	W.	25 20 32	3031	26 50 3	3014	28 19 58	2995	29 50 17	2977
	MARS	E.	71 40 13	3144	70 12 57	3137	68 45 32	3129	67 17 57	3120

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XV^h	P. L. of Diff.	XVIII^h	P. L. of Diff.	XXI^h	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
1	*a* Arietis	W.	111 51 23	3211	113 17 18	3216	114 43 8	3221	116 8 52	3226
	Aldebaran	W.	81 35 35	3084	83 4 4	3086	84 32 30	3088	86 0 54	3089
	Pollux	W.	37 28 21	3098	38 56 33	3098	40 24 45	3098	41 52 57	3098
	Spica	E.	53 23 5	3112	51 55 9	3116	50 27 18	3119	48 59 32	3123
	Antares	E.	99 14 18	3091	97 45 57	3093	96 17 39	3095	94 49 23	3097
2	Aldebaran	W.	93 22 38	3092	94 50 57	3091	96 19 17	3091	97 47 38	3091
	Pollux	W.	49 14 0	3096	50 42 15	3095	52 10 31	3094	53 38 48	3092
	Spica	E.	41 41 41	3139	40 14 18	3143	38 47 0	3147	37 19 46	3151
	Antares	E.	87 28 18	3098	86 0 6	3098	84 31 54	3097	83 3 41	3097
3	Aldebaran	W.	105 9 35	3085	106 38 3	3083	108 6 34	3081	109 35 7	3078
	Pollux	W.	61 0 44	3082	62 29 15	3080	63 57 48	3078	65 26 24	3075
	Regulus	W.	25 7 8	3134	26 34 36	3125	28 2 15	3118	29 30 3	3111
	Spica	E.	30 5 3	3180	28 38 30	3188	27 12 7	3198	25 45 56	3211
	Antares	E.	75 42 23	3091	74 14 3	3089	72 45 40	3087	71 17 15	3085
	a Aquilæ	E.	118 49 49	4083	117 39 31	4055	116 28 46	4028	115 17 34	4002
4	Aldebaran	W.	116 58 38	3065	118 27 30	3063	119 56 25	3060	121 25 24	3056
	Pollux	W.	72 50 22	3059	74 19 22	3056	75 48 26	3052	77 17 35	3047
	Regulus	W.	36 51 3	3080	38 19 37	3075	39 48 17	3070	41 17 4	3065
	JUPITER	W.	29 45 21	3052	31 14 30	3046	32 43 46	3040	34 13 9	3034
	Antares	E.	63 54 26	3072	62 25 43	3069	60 56 56	3067	59 28 6	3064
	a Aquilæ	E.	109 15 41	3896	108 2 17	3877	106 48 34	3860	105 34 34	3845
	MARS	E.	111 33 7	3303	110 8 59	3299	108 44 46	3295	107 20 29	3291
5	Pollux	W.	84 44 36	3026	86 14 16	3022	87 44 2	3017	89 13 54	3011
	Regulus	W.	48 42 37	3037	50 12 4	3031	51 41 38	3026	53 11 19	3021
	JUPITER	W.	41 41 49	3007	43 11 53	3001	44 42 4	2996	46 12 22	2990
	Antares	E.	52 3 0	3048	50 33 47	3045	49 4 30	3042	47 35 9	3039
	a Aquilæ	E.	99 20 57	3782	98 5 36	3772	96 50 4	3762	95 34 22	3753
	MARS	E.	100 17 48	3269	98 53 0	3264	97 28 6	3259	96 3 6	3253
6	Pollux	W.	96 44 50	2985	98 15 21	2979	99 45 59	2973	101 16 45	2968
	Regulus	W.	60 41 27	2991	62 11 51	2985	63 42 23	2979	65 13 3	2973
	JUPITER	W.	53 45 38	2962	55 16 39	2956	56 47 47	2950	58 19 3	2943
	Antares	E.	40 7 25	3024	38 37 41	3022	37 7 55	3020	35 38 7	3018
	a Aquilæ	E.	89 13 52	3721	87 57 27	3717	86 40 58	3714	85 24 25	3711
	MARS	E.	88 56 30	3225	87 30 51	3219	86 5 5	3213	84 39 11	3207
7	Pollux	W.	108 52 26	2937	110 23 58	2931	111 55 38	2924	113 27 27	2917
	Regulus	W.	72 48 21	2939	74 19 50	2932	75 51 28	2925	77 23 15	2918
	JUPITER	W.	65 57 24	2911	67 29 29	2905	69 1 42	2898	70 34 4	2890
	Antares	E.	28 8 45	3019	26 38 56	3023	25 9 12	3028	23 39 34	3034
	MARS	E.	77 27 48	3173	76 1 7	3166	74 34 18	3159	73 7 20	3152
	a Aquilæ	E.	79 1 17	3710	77 44 41	3712	76 28 7	3716	75 11 37	3721
	Fomalhaut	E.	110 51 20	3128	109 23 44	3117	107 55 55	3107	106 27 54	3097
8	Regulus	W.	85 4 30	2880	86 37 14	2872	88 10 9	2863	89 43 15	2855
	JUPITER	W.	78 18 16	2853	79 51 35	2845	81 25 5	2836	82 58 46	2828
	Spica	W.	31 20 59	2960	32 52 2	2945	34 23 24	2930	35 55 5	2916
	MARS	E.	65 50 12	3112	64 22 18	3104	62 54 13	3096	61 25 58	3087

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	III^{h}	P. L. of Diff.	VI^{h}	P. L. of Diff.	IX^{h}	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
8	*a* Aquilæ	E.	73 55 13	3727	72 38 55	3734	71 22 43	3742	70 6 40	3751
	Fomalhaut	E.	104 59 40	3087	103 31 14	3077	102 2 36	3067	100 33 46	3058
	a Pegasi	E.	121 26 6	3471	120 5 10	3447	118 43 47	3423	117 21 57	3401
9	Regulus	W.	91 16 31	2847	92 49 58	2838	94 23 36	2830	95 57 25	2821
	Jupiter	W.	84 32 37	2820	86 6 39	2811	87 40 52	2803	89 15 16	2794
	Spica	W.	37 27 3	2903	38 59 18	2890	40 31 50	2877	42 4 39	2864
	Mars	E.	59 57 32	3078	58 28 55	3069	57 0 8	3060	55 31 9	3051
	a Aquilæ	E.	63 49 23	3822	62 34 44	3842	61 20 25	3865	60 6 29	3890
	Fomalhaut	E.	93 6 43	3011	91 36 44	3002	90 6 34	2993	88 36 13	2985
	a Pegasi	E.	110 26 45	3303	109 2 37	3285	107 38 8	3268	106 13 19	3252
10	Regulus	W.	103 49 32	2773	105 24 35	2763	106 59 51	2753	108 35 21	2743
	Jupiter	W.	97 10 16	2747	98 45 54	2737	100 21 44	2727	101 57 48	2717
	Spica	W.	49 52 41	2803	51 27 5	2791	53 1 44	2779	54 36 39	2767
	Mars	E.	48 3 18	3001	46 33 7	2991	45 2 43	2980	43 32 6	2969
	a Aquilæ	E.	54 4 9	4063	52 53 31	4109	51 43 38	4161	50 34 35	4218
	Fomalhaut	E.	81 1 43	2942	79 30 17	2933	77 58 40	2925	76 26 53	2917
	a Pegasi	E.	99 4 44	3179	97 38 10	3166	96 11 20	3153	94 44 15	3141
	Sun	E.	127 34 24	3130	126 6 51	3118	124 39 3	3106	123 11 0	3094
11	Jupiter	W.	110 1 38	2663	111 39 8	2652	113 16 53	2640	114 54 54	2628
	Spica	W.	62 35 15	2706	64 11 48	2693	65 48 37	2680	67 25 43	2667
	Mars	E.	35 55 34	2914	34 23 33	2903	32 51 18	2891	31 18 48	2880
	Fomalhaut	E.	68 45 26	2880	67 12 41	2873	65 39 47	2866	64 6 45	2860
	a Pegasi	E.	87 25 12	3085	85 56 44	3075	84 28 3	3065	82 59 10	3056
	Sun	E.	115 47 0	3030	114 17 25	3017	112 47 34	3004	111 17 26	2991
12	Spica	W.	75 35 37	2601	77 14 30	2588	78 53 41	2574	80 33 11	2561
	Antares	W.	29 48 23	2649	31 26 11	2629	33 4 26	2610	34 43 6	2592
	Fomalhaut	E.	56 19 49	2838	54 46 10	2836	53 12 29	2835	51 38 46	2835
	a Pegasi	E.	75 32 10	3018	74 2 19	3013	72 32 21	3008	71 2 18	3004
	Sun	E.	103 42 30	2921	102 10 38	2906	100 38 27	2892	99 5 58	2877
13	Spica	W.	88 55 25	2491	90 36 50	2477	92 18 35	2463	94 0 39	2449
	Antares	W.	43 2 38	2506	44 43 43	2489	46 25 11	2473	48 7 2	2457
	a Pegasi	E.	63 31 8	2999	62 0 54	3002	60 30 43	3006	59 0 38	3013
	Sun	E.	91 18 45	2802	89 44 19	2787	88 9 34	2772	86 34 29	2756
14	Spica	W.	102 36 4	2379	104 20 9	2366	106 4 33	2352	107 49 17	2338
	Antares	W.	56 41 54	2379	58 25 59	2364	60 10 26	2349	61 55 15	2334
	Sun	E.	78 33 58	2680	76 56 51	2664	75 19 23	2649	73 41 35	2634
15	Antares	W.	70 44 38	2262	72 31 33	2249	74 18 48	2235	76 6 23	2222
	Sun	E.	65 27 30	2561	63 47 42	2548	62 7 35	2534	60 27 9	2520
16	Antares	W.	85 9 1	2163	86 58 25	2152	88 48 6	2142	90 38 2	2132
	Mars	W.	29 46 28	2360	31 31 0	2348	33 15 50	2336	35 0 58	2324
	Sun	E.	52 0 31	2461	50 18 22	2450	48 35 58	2439	46 53 19	2429
17	Antares	W.	99 51 14	2090	101 42 29	2083	103 33 54	2077	105 25 28	2072
	Mars	W.	43 50 29	2277	45 37 3	2269	47 23 49	2262	49 10 45	2256

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh	P. L. of Diff.	XVIIIh	P. L. of Diff.	XXIh	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
8	α Aquilæ	E.	68 50 46	3762	67 35 4	3775	66 19 35	3789	65 4 21	3805
	Fomalhaut	E.	99 4 45	3048	97 35 32	3039	96 6 7	3030	94 36 31	3020
	α Pegasi	E.	115 59 42	3379	114 37 2	3359	113 13 59	3339	111 50 33	3320
9	Regulus	W.	97 31 26	2811	99 5 39	2802	100 40 4	2792	102 14 42	2783
	Jupiter	W.	90 49 52	2785	92 24 39	2775	93 59 39	2766	95 34 51	2756
	Spica	W.	43 37 44	2852	45 11 5	2840	46 44 41	2828	48 18 33	2815
	Mars	E.	54 1 59	3041	52 32 37	3031	51 3 3	3021	49 33 17	3011
	α Aquilæ	E.	58 52 59	3918	57 39 57	3949	56 27 26	3983	55 15 29	4020
	Fomalhaut	E.	87 5 41	2976	85 34 58	2967	84 4 4	2958	82 32 59	2950
	α Pegasi	E.	104 48 12	3236	103 22 46	3222	101 57 3	3207	100 31 2	3193
10	Regulus	W.	110 11 4	2732	111 47 1	2722	113 23 12	2711	114 59 37	2701
	Jupiter	W.	103 34 6	2706	105 10 37	2695	106 47 23	2685	108 24 23	2674
	Spica	W.	56 11 50	2755	57 47 17	2743	59 23 0	2731	60 58 59	2718
	Mars	E.	42 1 15	2959	40 30 11	2948	38 58 53	2937	37 27 21	2925
	α Aquilæ	E.	49 26 26	4282	48 19 17	4354	47 13 14	4433	46 8 22	4520
	Fomalhaut	E.	74 54 55	2909	73 22 47	2901	71 50 30	2894	70 18 3	2887
	α Pegasi	E.	93 16 55	3129	91 49 20	3117	90 21 31	3106	88 53 28	3095
	Sun	E.	121 42 43	3082	120 14 11	3069	118 45 23	3056	117 16 19	3043
11	Jupiter	W.	116 33 11	2616	118 11 44	2604	119 50 33	2592	121 29 38	2580
	Spica	W.	69 3 7	2655	70 40 48	2642	72 18 46	2629	73 57 2	2615
	Mars	E.	29 46 4	2869	28 13 5	2858	26 39 52	2846	25 6 24	2835
	Fomalhaut	E.	62 33 35	2855	61 0 18	2850	59 26 54	2845	57 53 24	2841
	α Pegasi	E.	81 30 6	3047	80 0 52	3039	78 31 27	3031	77 1 53	3024
	Sun	E.	109 47 2	2977	108 16 20	2963	106 45 21	2949	105 14 4	2935
12	Spica	W.	82 12 59	2547	83 53 7	2534	85 33 33	2520	87 14 19	2505
	Antares	W.	36 22 12	2574	38 1 42	2556	39 41 37	2539	41 21 56	2522
	Fomalhaut	E.	50 5 4	2837	48 31 24	2840	46 57 48	2845	45 24 18	2852
	α Pegasi	E.	69 32 9	3000	68 1 56	2998	66 31 41	2997	65 1 24	2997
	Sun	E.	97 33 10	2862	96 0 3	2847	94 26 37	2832	92 52 51	2817
13	Spica	W.	95 43 4	2435	97 25 49	2421	99 8 54	2407	100 52 19	2393
	Antares	W.	49 49 15	2441	51 31 51	2425	53 14 50	2410	54 58 11	2394
	α Pegasi	E.	57 30 41	3022	56 0 55	3033	54 31 23	3047	53 2 8	3065
	Sun	E.	84 59 4	2741	83 23 18	2725	81 47 12	2 10	80 10 45	2695
14	Spica	W.	109 34 21	2325	111 19 44	2312	113 5 27	2299	114 51 28	2286
	Antares	W.	63 40 25	2319	65 25 57	2304	67 11 50	2290	68 58 4	2276
	Sun	E.	72 3 26	2619	70 24 57	2604	68 46 8	2590	67 6 59	2575
15	Antares	W.	77 54 18	2209	79 42 32	2197	81 31 4	2185	83 19 54	2174
	Sun	E.	58 46 24	2507	57 5 21	2495	55 24 1	2483	53 42 24	2472
16	Antares	W.	92 28 13	2122	94 18 39	2113	96 9 18	2105	98 0 10	2097
	Mars	W.	36 46 23	2313	38 32 3	2303	40 17 58	2294	42 4 7	2285
	Sun	E.	45 10 26	2420	43 27 20	2412	41 44 3	2405	40 0 35	2398
17	Antares	W.	107 17 10	2068	109 8 59	2064	111 0 55	2060	112 52 56	2057
	Mars	W.	50 57 50	2250	52 45 3	2245	54 32 24	2241	56 19 51	2237

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	III^h	P. L. of Diff.	VI^h	P. L. of Diff.	IX^h	P. L. of Diff
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
17	SUN	E.	38 16 57	2392	36 33 10	2387	34 49 16	2382	33 5 16	2379
22	SUN	W.	31 14 23	2644	32 52 18	2660	34 29 52	2676	36 7 4	2692
	Regulus	E.	85 39 10	2314	83 53 31	2331	82 8 16	2348	80 23 26	2365
	JUPITER	E.	91 45 40	2300	89 59 41	2318	88 14 8	2335	86 29 0	2353
23	SUN	W.	44 7 25	2781	45 42 18	2800	47 16 46	2819	48 50 50	2838
	Regulus	E.	71 45 38	2456	70 3 22	2475	68 21 33	2494	66 40 11	2512
	JUPITER	E.	77 49 42	2443	76 7 9	2462	74 25 2	2480	72 43 21	2499
	Spica	E.	125 44 28	2480	124 2 47	2497	122 21 29	2514	120 40 35	2531
24	SUN	W.	56 35 0	2933	58 6 37	2952	59 37 49	2971	61 8 38	2990
	Aldebaran	W.	22 40 51	2680	24 17 58	2688	25 54 54	2697	27 31 39	2707
	Regulus	E.	58 19 50	2607	56 41 4	2625	55 2 43	2644	53 24 48	2663
	JUPITER	E.	64 21 27	2593	62 42 22	2611	61 3 42	2629	59 25 27	2648
	Spica	E.	112 22 5	2618	110 43 35	2636	109 5 29	2653	107 27 46	2671
25	SUN	W.	68 36 55	3082	70 5 27	3099	71 33 38	3116	73 1 28	3133
	Aldebaran	W.	35 31 34	2769	37 6 42	2783	38 41 32	2797	40 16 4	2810
	Regulus	E.	45 21 26	2755	43 45 59	2773	42 10 55	2791	40 36 15	2809
	JUPITER	E.	51 20 20	2737	49 44 30	2754	48 9 2	2772	46 33 57	2789
	Spica	E.	99 24 57	2755	97 49 30	2772	96 14 25	2788	94 39 41	2803
26	SUN	W.	80 15 40	3213	81 41 34	3228	83 7 10	3242	84 32 29	3256
	Aldebaran	W.	48 4 23	2876	49 37 12	2889	51 9 44	2902	52 42 0	2914
	Regulus	E.	32 48 43	2898	31 16 22	2916	29 44 24	2935	28 12 49	2954
	JUPITER	E.	38 44 0	2870	37 11 3	2886	35 38 27	2902	34 6 11	2917
	Spica	E.	86 50 59	2877	85 18 12	2891	83 45 42	2905	82 13 29	2918
27	SUN	W.	91 35 9	3319	92 58 58	3330	94 22 33	3341	95 45 56	3351
	Aldebaran	W.	60 19 41	2969	61 50 33	2979	63 21 11	2989	64 51 37	2998
	Spica	E.	74 36 31	2979	73 5 52	2990	71 35 27	3000	70 5 15	3010
	Antares	E.	120 30 41	2977	118 59 59	2985	117 29 28	2994	115 59 9	3004
28	SUN	W.	102 40 5	3397	104 2 25	3404	105 24 37	3411	106 46 41	3418
	Aldebaran	W.	72 21 9	3038	73 50 35	3044	75 19 53	3050	76 49 3	3056
	Pollux	W.	28 14 5	3062	29 43 1	3065	31 11 53	3069	32 40 41	3072
	Spica	E.	62 37 13	3056	61 8 9	3064	59 39 15	3071	58 10 30	3078
	Antares	E.	108 30 12	3043	107 0 53	3049	105 31 41	3055	104 2 37	3061
29	SUN	W.	113 35 20	3443	114 56 47	3446	116 18 11	3449	117 39 32	3452
	Aldebaran	W.	84 13 17	3079	85 41 52	3082	87 10 24	3085	88 38 52	3087
	Pollux	W.	40 3 43	3086	41 32 10	3088	43 0 34	3090	44 28 56	3091
	Spica	E.	50 48 48	3109	49 20 49	3114	47 52 57	3119	46 25 11	3124
	Antares	E.	96 38 53	3084	95 10 24	3087	93 41 58	3090	92 13 36	3092
30	SUN	W.	124 25 37	3460	125 46 46	3460	127 7 55	3460	128 29 4	3459
	Aldebaran	W.	96 0 37	3094	97 28 55	3094	98 57 11	3094	100 25 28	3092
	Pollux	W.	51 50 27	3093	53 18 45	3093	54 47 3	3092	56 15 22	3091
	Spica	E.	39 7 45	3148	37 40 33	3152	36 13 26	3157	34 46 25	3162
	Antares	E.	84 52 18	3098	83 24 5	3099	81 55 54	3098	80 27 42	3097

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XV^{h}	P. L. of Diff.	XVIII^{h}	P. L. of Diff.	XXI^{h}	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
17	SUN	E.	31 21 11	2378	29 37 4	2378	27 52 57	2379	26 8 51	2380
22	SUN	W.	37 43 54	2709	39 20 21	2726	40 56 26	2744	42 32 8	2763
	Regulus	E.	78 39 1	2383	76 55 2	2401	75 11 28	2419	73 28 20	2437
	JUPITER	E.	84 44 17	2371	83 0 0	2388	81 16 8	2406	79 32 42	2424
23	SUN	W.	50 24 29	2857	51 57 43	2876	53 30 33	2895	55 2 59	2914
	Regulus	E.	64 59 14	2531	63 18 44	2550	61 38 40	2569	59 59 2	2588
	JUPITER	E.	71 2 6	2518	69 21 18	2536	67 40 55	2555	66 0 58	2574
	Spica	E.	119 0 5	2548	117 19 59	2566	115 40 17	2583	114 0 59	2601
24	SUN	W.	62 39 3	3009	64 9 5	3027	65 38 44	3045	67 8 1	3064
	Aldebaran	W.	29 8 10	2718	30 44 26	2730	32 20 26	2743	33 56 9	2756
	Regulus	E.	51 47 18	2681	50 10 13	2700	48 33 33	2719	46 57 18	2737
	JUPITER	E.	57 47 37	2666	56 10 12	2684	54 33 11	2702	52 56 34	2719
	Spica	E.	105 50 27	2688	104 13 31	2705	102 36 57	2722	101 0 46	2738
25	SUN	W.	74 28 58	3150	75 56 7	3166	77 22 57	3182	78 49 28	3198
	Aldebaran	W.	41 50 19	2824	43 24 16	2838	44 57 55	2851	46 31 17	2863
	Regulus	E.	39 1 59	2827	37 28 5	2845	35 54 35	2862	34 21 27	2880
	JUPITER	E.	44 59 15	2805	43 24 54	2822	41 50 55	2838	40 17 17	2854
	Spica	E.	93 5 17	2819	91 31 14	2834	89 57 30	2848	88 24 5	2863
26	SUN	W.	85 57 32	3270	87 22 19	3283	88 46 50	3295	90 11 7	3307
	Aldebaran	W.	54 14 1	2926	55 45 47	2937	57 17 18	2948	58 48 36	2958
	Regulus	E.	26 41 38	2973	25 10 52	2993	23 40 31	3015	22 10 37	3039
	JUPITER	E.	32 34 14	2933	31 2 37	2948	29 31 19	2964	28 0 21	2979
	Spica	E.	80 41 34	2931	79 9 55	2944	77 38 32	2956	76 7 24	2968
27	SUN	W.	97 9 8	3361	98 32 8	3371	99 54 57	3380	101 17 36	3389
	Aldebaran	W.	66 21 52	3007	67 51 56	3015	69 21 50	3023	70 51 34	3030
	Spica	E.	68 35 15	3020	67 5 28	3030	65 35 52	3039	64 6 27	3047
	Antares	E.	114 29 1	3013	112 59 4	3021	111 29 17	3029	109 59 40	3036
28	SUN	W.	108 8 37	3424	109 30 26	3429	110 52 10	3434	112 13 48	3439
	Aldebaran	W.	78 18 6	3062	79 47 2	3067	81 15 52	3071	82 44 37	3075
	Pollux	W.	34 9 25	3075	35 38 5	3078	37 6 41	3081	38 35 14	3084
	Spica	E.	56 41 54	3085	55 13 26	3091	53 45 6	3097	52 16 53	3103
	Antares	E.	102 33 40	3067	101 4 50	3072	99 36 6	3076	98 7 27	3080
29	SUN	W.	119 0 49	3454	120 22 4	3456	121 43 16	3458	123 4 27	3459
	Aldebaran	W.	90 7 17	3089	91 35 39	3091	93 4 0	3092	94 32 19	3093
	Pollux	W.	45 57 16	3092	47 25 35	3093	48 53 52	3094	50 22 9	3093
	Spica	E.	44 57 30	3129	43 29 55	3133	42 2 26	3138	40 35 3	3143
	Antares	E.	90 45 16	3094	89 16 59	3096	87 48 44	3097	86 20 31	3097
30	SUN	W.	129 50 14	3458	131 11 25	3457	132 32 37	3455	133 53 51	3453
	Aldebaran	W.	101 53 47	3091	103 22 7	3090	104 50 27	3089	106 18 50	3087
	Pollux	W.	57 43 42	3089	59 12 4	3087	60 40 29	3085	62 8 57	3083
	Spica	E.	33 19 30	3168	31 52 42	3175	30 26 2	3182	28 59 31	3189
	Antares	E.	78 59 29	3096	77 31 15	3095	76 3 0	3093	74 34 43	3091

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Semi-diameter.	Sidereal Time of Semi-diameter Passing Meridian.	Equation of Time, to be Subtracted from Apparent Time.	Diff. for 1 Hour.
		h m s	s	° ′ ″	″	′ ″	s	m s	s
Sat.	1	2 32 9.07	9.532	N.14 57 56.6	+45.59	15 53.94	66.00	2 55.86	0.324
SUN.	2	2 35 58.09	9.554	15 16 3.5	44.97	15 53.70	66.08	3 3.37	0.302
Mon.	3	2 39 47.64	9.576	15 33 55.0	44.33	15 53.47	66.16	3 10.36	0.280
Tues.	4	2 43 37.73	9.599	15 51 31.1	+43.67	15 53.24	66.24	3 16.81	0.257
Wed.	5	2 47 28.38	9.622	16 8 51.4	43.01	15 53.01	66.32	3 22.70	0.234
Thur.	6	2 51 19.59	9.646	16 25 55.7	42.33	15 52.78	66.40	3 28.03	0.210
Frid.	7	2 55 11.37	9.670	16 42 43.7	+41.65	15 52.56	66.48	3 32.79	0.186
Sat.	8	2 59 3.73	9.694	16 59 14.9	40.95	15 52.33	66.56	3 36.98	0.162
SUN.	9	3 2 56.66	9.718	17 15 29.2	40.24	15 52.11	66.65	3 40.59	0.138
Mon.	10	3 6 50.18	9.742	17 31 26.5	+39.52	15 51.89	66.73	3 43.62	0.114
Tues.	11	3 10 44.30	9.767	17 47 6.3	38.79	15 51.67	66.81	3 46.05	0.089
Wed.	12	3 14 39.01	9.792	18 2 28.4	38.04	15 51.45	66.89	3 47.89	0.064
Thur.	13	3 18 34.31	9.817	18 17 32.5	+37.28	15 51.24	66.97	3 49.14	0.039
Frid.	14	3 22 30.21	9.842	18 32 18.2	36.51	15 51.03	67.05	3 49.79	0.014
Sat.	15	3 26 26.70	9.867	18 46 45.2	35.73	15 50.82	67.13	3 49.85	0.010
SUN.	16	3 30 23.78	9.891	19 0 53.4	+34.94	15 50.62	67.22	3 49.33	0.034
Mon.	17	3 34 21.45	9.915	19 14 42.5	34.14	15 50.42	67.30	3 48.23	0.058
Tues.	18	3 38 19.70	9.939	19 28 12.0	33.32	15 50.23	67.38	3 46.54	0.082
Wed.	19	3 42 18.51	9.962	19 41 21.7	+32.49	15 50.04	67.46	3 44.29	0.105
Thur.	20	3 46 17.87	9.985	19 54 11.4	31.65	15 49.86	67.54	3 41.49	0.128
Frid.	21	3 50 17.77	10.007	20 6 40.8	30.80	15 49.68	67.61	3 38.15	0.150
Sat.	22	3 54 18.21	10.029	20 18 49.5	+29.93	15 49.50	67.69	3 34.29	0.172
SUN.	23	3 58 19.16	10.051	20 30 37.3	29.05	15 49.33	67.76	3 29.91	0.194
Mon.	24	4 2 20.63	10.072	20 42 3.9	28.16	15 49.16	67.84	3 25.01	0.215
Tues.	25	4 6 22.60	10.092	20 53 9.1	+27.27	15 49.00	67.91	3 19.61	0.235
Wed.	26	4 10 25.05	10.112	21 3 52.9	26.37	15 48.84	67.98	3 13.73	0.255
Thur.	27	4 14 27.97	10.132	21 14 14.9	25.45	15 48.69	68.05	3 7.38	0.274
Frid.	28	4 18 31.36	10.151	21 24 14.8	+24.52	15 48.54	68.12	3 0.58	0.293
Sat.	29	4 22 35.20	10.169	21 33 52.3	23.59	15 48.40	68.18	2 53.32	0.312
SUN.	30	4 26 39.48	10.187	21 43 7.4	22.65	15 48.25	68.25	2 45.61	0.330
Mon.	31	4 30 44.18	10.204	21 51 59.9	21.71	15 48.11	68.31	2 37.48	0.347
Tues.	32	4 34 49.29	10.221	N.22 0 29.5	+20.76	15 47.98	68.37	2 28.96	0.364

NOTE.—The mean time of semidiameter passing the meridian may be found by subtracting 0s.19 from the sidereal time. The sign + prefixed to the hourly change of declination indicates that north declinations are increasing.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S Apparent Right Ascension.	THE SUN'S Diff. for 1 Hour.	THE SUN'S Apparent Declination.	THE SUN'S Diff. for 1 Hour.	Equation of Time, to be Added to Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		h m s	s	° ′ ″	″	m s	s	h m s
Sat.	1	2 32 9.53	9.532	N.14 57 58.9	+45.59	2 55.88	0.324	2 35 5.41
SUN.	2	2 35 58.57	9.554	15 16 5.8	44.97	3 3.39	0.302	2 39 1.96
Mon.	3	2 39 48.15	9.577	15 33 57.4	44.32	3 10.37	0.280	2 42 58.52
Tues.	4	2 43 38.26	9.600	15 51 33.5	+43.67	3 16.81	0.257	2 46 55.07
Wed.	5	2 47 28.93	9.623	16 8 53.8	43.01	3 22.70	0.234	2 50 51.63
Thur.	6	2 51 20.15	9.646	16 25 58.1	42.34	3 28.03	0.210	2 54 48.18
Frid.	7	2 55 11.94	9.670	16 42 46.1	+41.65	3 32.80	0.186	2 58 44.74
Sat.	8	2 59 4.31	9.694	16 59 17.4	40.95	3 36.99	0.162	3 2 41.30
SUN.	9	3 2 57.25	9.718	17 15 31.7	40.23	3 40.60	0.138	3 6 37.85
Mon.	10	3 6 50.78	9.742	17 31 28.9	+39.51	3 43.63	0.114	3 10 34.41
Tues.	11	3 10 44.90	9.766	17 47 8.8	38.79	3 46.06	0.089	3 14 30.96
Wed.	12	3 14 39.62	9.791	18 2 30.8	38.04	3 47.90	0.064	3 18 27.52
Thur.	13	3 18 34.93	9.816	18 17 34.9	+37.28	3 49.15	0.039	3 22 24.08
Frid.	14	3 22 30.83	9.841	18 32 20.5	36.51	3 49.80	0.014	3 26 20.63
Sat.	15	3 26 27.33	9.866	18 46 47.5	35.73	3 49.85	0.010	3 30 17.19
SUN.	16	3 30 24.42	9.891	19 0 55.7	+34.93	3 49.32	0.034	3 34 13.74
Mon.	17	3 34 22.08	9.915	19 14 44.7	34.13	3 48.22	0.058	3 38 10.30
Tues.	18	3 38 20.32	9.939	19 28 14.1	33.31	3 46.54	0.082	3 42 6.86
Wed.	19	3 42 19.12	9.962	19 41 23.8	+32.48	3 44.29	0.105	3 46 3.41
Thur.	20	3 46 18.48	9.985	19 54 13.4	31.64	3 41.49	0.128	3 49 59.97
Frid.	21	3 50 18.38	10.007	20 6 42.7	30.78	3 38.15	0.150	3 53 56.53
Sat.	22	3 54 18.80	10.029	20 18 51.3	+29.91	3 34.28	0.172	3 57 53.08
SUN.	23	3 58 19.75	10.050	20 30 39.0	29.04	3 29.89	0.194	4 1 49.64
Mon.	24	4 2 21.21	10.071	20 42 5.5	28.15	3 24.99	0.215	4 5 46.20
Tues.	25	4 6 23.16	10.092	20 53 10.6	+27.26	3 19.59	0.235	4 9 42.75
Wed.	26	4 10 25.60	10.112	21 3 54.2	26.36	3 13.71	0.255	4 13 39.31
Thur.	27	4 14 28.50	10.131	21 14 16.2	25.45	3 7.37	0.274	4 17 35.87
Frid.	28	4 18 31.87	10.150	21 24 16.0	+24.52	3 0.56	0.293	4 21 32.43
Sat.	29	4 22 35.69	10.168	21 33 53.4	23.59	2 53.29	0.312	4 25 28.98
SUN.	30	4 26 39.95	10.186	21 43 8.4	22.65	2 45.59	0.330	4 29 25.54
Mon.	31	4 30 44.63	10.204	21 52 0.8	21.70	2 37.47	0.347	4 33 22.10
Tues.	32	4 34 49.71	10.220	N.22 0 30.4	+20.75	2 28.94	0.364	4 37 18.66

NOTE.—The semidiameter for mean noon may be assumed the same as that for apparent noon. The sign + prefixed to the hourly change of declination indicates that north declinations are increasing.

Diff. for 1 Hour, +9^s.8565. (Table III.)

AT GREENWICH MEAN NOON.

Day of the Month.	Day of the Year.	THE SUN'S TRUE LONGITUDE. λ	THE SUN'S TRUE LONGITUDE. λ′	Diff. for 1 Hour.	LATITUDE.	Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.
		° ′ ″	′ ″	″	″			h m s
1	121	40 27 53.9	27 55.2	145.47	+ 0.78	0.003 4282	+ 44.4	21 21 24.09
2	122	41 26 4.1	26 5.3	145.39	0.75	0.003 5346	44.1	21 17 28.18
3	123	42 24 12.4	24 13.5	145.31	0.69	0.003 6403	43.9	21 13 32.27
4	124	43 22 18.9	22 19.8	145.24	+ 0.61	0.003 7454	+ 43.6	21 9 36.36
5	125	44 20 23.7	20 24.5	145.17	0.51	0.003 8499	43.4	21 5 40.46
6	126	45 18 26.8	18 27.5	145.10	0.40	0.003 9538	43.2	21 1 44.55
7	127	46 16 28.3	16 28.8	145.03	+ 0.29	0.004 0570	+ 42.9	20 57 48.63
8	128	47 14 28.3	14 28.7	144.97	0.15	0.004 1596	42.6	20 53 52.73
9	129	48 12 26.8	12 27.1	144.91	+ 0.02	0.004 2614	42.2	20 49 56.82
10	130	49 10 24.0	10 24.1	144.85	— 0.10	0.004 3624	+ 41.8	20 46 0.91
11	131	50 8 19.8	8 19.8	144.80	0.21	0.004 4623	41.4	20 42 5.00
12	132	51 6 14.4	6 14.2	144.75	0.30	0.004 5611	40.9	20 38 9.09
13	133	52 4 7.8	4 7.5	144.70	— 0.33	0.004 6586	+ 40.3	20 34 13.18
14	134	53 2 0.0	1 59.5	144.65	0.34	0.004 7546	39.6	20 30 17.27
15	135	53 59 51.0	59 50.4	144.60	0.33	0.004 8489	38.9	20 26 21.36
16	136	54 57 40.8	57 40.0	144.55	— 0.27	0.004 9415	+ 38.1	20 22 25.44
17	137	55 55 29.4	55 28.5	144.50	0.19	0.005 0321	37.3	20 18 29.53
18	138	56 53 16.8	53 15.7	144.45	— 0.09	0.005 1206	36.4	20 14 33.62
19	139	57 51 2.8	51 1.6	144.39	+ 0.03	0.005 2070	+ 35.5	20 10 37.71
20	140	58 48 47.5	48 46.1	144.33	0.17	0.005 2912	34.6	20 6 41.80
21	141	59 46 30.8	46 29.3	144.27	0.30	0.005 3732	33.7	20 2 45.89
22	142	60 44 12.7	44 11.0	144.21	+ 0.45	0.005 4532	+ 32.8	19 58 49.98
23	143	61 41 53.1	41 51.2	144.15	0.58	0.005 5310	32.0	19 54 54.07
24	144	62 39 32.1	39 30.0	144.09	0.69	0.005 6068	31.2	19 50 58.16
25	145	63 37 9.5	37 7.3	144.03	+ 0.77	0.005 6807	+ 30.4	19 47 2.25
26	146	64 34 45.5	34 43.1	143.97	0.82	0.005 7528	29.7	19 43 6.33
27	147	65 32 20.1	32 17.5	143.91	0.85	0.005 8232	29.0	19 39 10.42
28	148	66 29 53.2	29 50.5	143.85	+ 0.87	0.005 8920	+ 28.3	19 35 14.51
29	149	67 27 25.0	27 22.1	143.80	0.85	0.005 9592	27.7	19 31 18.60
30	150	68 24 55.5	24 52.4	143.74	0.79	0.006 0249	27.1	19 27 22.69
31	151	69 22 24.7	22 21.4	143.69	0.72	0.006 0892	26.5	19 23 26.78
32	152	70 19 52.7	19 49.2	143.64	+ 0.63	0.006 1521	+ 25.9	19 19 30.87

NOTE.—The numbers in column λ correspond to the true equinox of the date; in column λ′ to the mean equinox of January $0^d.0$.

Diff. for 1 Hour,
- - $9^s.8296$.
(Table II.)

GREENWICH MEAN TIME.

THE MOON'S

Day of the Month.	SEMIDIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
	′ ″	′ ″	′ ″	″	′ ″	″	h m	m	d
1	14 46.0	14 46.8	54 5.6	+ 0.17	54 8.6	+ 0.32	9 33.9	1.68	11.3
2	14 48.1	14 49.9	54 13.4	0.47	54 19.8	0.60	10 14.2	1.69	12.3
3	14 52.1	14 54.6	54 27.8	0.71	54 37.0	0.82	10 55.2	1.73	13.3
4	14 57.4	15 0.5	54 47.4	+ 0.90	54 58.7	+ 0.98	11 37.7	1.81	14.3
5	15 3.8	15 7.3	55 11.0	1.05	55 23.9	1.10	12 22.6	1.93	15.3
6	15 11.0	15 14.9	55 37.4	1.15	55 51.5	1.19	13 10.4	2.06	16.3
7	15 18.8	15 22.8	56 5.9	+ 1.22	56 20.8	+ 1.25	14 1.7	2.20	17.3
8	15 26.9	15 31.1	56 35.9	1.27	56 51.3	1.29	14 56.0	2.32	18.3
9	15 35.4	15 39.7	57 6.9	1.31	57 22.7	1.33	15 52.6	2.38	19.3
10	15 44.0	15 48.4	57 38.7	+ 1.33	57 54.7	+ 1.33	16 49.9	2.38	20.3
11	15 52.8	15 57.1	58 10.8	1.33	58 26.7	1.31	17 46.4	2.33	21.3
12	16 1.4	16 5.5	58 42.3	1.28	58 57.5	1.23	18 41.3	2.24	22.3
13	16 9.4	16 13.1	59 12.0	+ 1.16	59 25.5	+ 1.07	19 34.2	2.17	23.3
14	16 16.4	16 19.3	59 37.6	0.94	59 48.2	0.79	20 25.6	2.12	24.3
15	16 21.6	16 23.3	59 56.7	0.61	60 2.9	+ 0.40	21 16.3	2.11	25.3
16	16 24.2	16 24.4	60 6.4	+ 0.17	60 7.0	− 0.08	22 7.4	2.15	26.3
17	16 23.7	16 22.2	60 4.5	− 0.34	59 58.8	0.61	22 59.7	2.22	27.3
18	16 19.8	16 16.5	59 49.9	0.88	59 37.8	1.13	23 53.9	2.30	28.3
19	16 12.4	16 7.6	59 22.8	− 1.36	59 5.1	− 1.57	☌	. . .	29.3
20	16 2.1	15 56.2	58 45.1	1.74	58 23.4	1.87	0 50.0	2.37	0.9
21	15 49.9	15 43.4	58 0.3	1.96	57 36.3	2.00	1 47.3	2.40	1.9
22	15 36.8	15 30.2	57 12.1	− 2.01	56 48.0	− 1.98	2 44.5	2.35	2.9
23	15 23.9	15 17.8	56 24.6	1.91	56 2.2	1.80	3 39.9	2.25	3.9
24	15 12.1	15 6.8	55 41.3	1.67	55 22.1	1.52	4 32.3	2.11	4.9
25	15 2.1	14 58.0	55 4.9	− 1.34	54 49.9	− 1.15	5 21.1	1.97	5.9
26	14 54.6	14 51.9	54 37.2	0.95	54 27.1	0.73	6 6.7	1.84	6.9
27	14 49.8	14 48.5	54 19.6	0.52	54 14.6	− 0.31	6 49.6	1.74	7.9
28	14 47.8	14 47.8	54 12.2	− 0.10	54 12.3	+ 0.11	7 30.7	1.69	8.9
29	14 48.6	14 49.9	54 14.9	+ 0.31	54 19.8	0.50	8 11.1	1.68	9.9
30	14 51.8	14 54.3	54 26.8	0.67	54 35.9	0.83	8 51.6	1.71	10.9
31	14 57.2	15 0.6	54 46.8	0.97	54 59.2	1.10	9 33.3	1.78	11.9
32	15 4.4	15 8.5	55 13.1	+1.20	55 28.0	+ 1.28	10 17.2	1.89	12.9

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	SATURDAY 1.					MONDAY 3.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	11 53 15.62	1.8085	N. 6 17 57.9	12.185	0	13 19 55.59	1.8255	S. 3 44 21.0	12.643
1	11 55 4.10	1.8075	6 5 46.0	12.211	1	13 21 45.17	1.8273	3 56 59.4	12.636
2	11 56 52.52	1.8065	5 53 32.6	12.236	2	13 23 34.87	1.8292	4 9 37.3	12.627
3	11 58 40.88	1.8055	5 41 17.7	12.260	3	13 25 24.68	1.8311	4 22 14.6	12.617
4	12 0 29.18	1.8047	5 29 1.4	12.283	4	13 27 14.60	1.8330	4 34 51.3	12.607
5	12 2 17.44	1.8039	5 16 43.7	12.307	5	13 29 4.64	1.8351	4 47 27.4	12.596
6	12 4 5.65	1.8031	5 4 24.6	12.329	6	13 30 54.81	1.8372	5 0 2.8	12.583
7	12 5 53.81	1.8024	4 52 4.2	12.350	7	13 32 45.11	1.8395	5 12 37.4	12.571
8	12 7 41.94	1.8019	4 39 42.6	12.371	8	13 34 35.54	1.8417	5 25 11.3	12.557
9	12 9 30.04	1.8013	4 27 19.7	12.392	9	13 36 26.10	1.8439	5 37 44.3	12.543
10	12 11 18.10	1.8007	4 14 55.6	12.411	10	13 38 16.81	1.8462	5 50 16.5	12.528
11	12 13 6.13	1.8002	4 2 30.4	12.430	11	13 40 7.65	1.8486	6 2 47.7	12.512
12	12 14 54.13	1.7998	3 50 4.0	12.448	12	13 41 58.64	1.8511	6 15 17.9	12.495
13	12 16 42.11	1.7996	3 37 36.6	12.466	13	13 43 49.78	1.8536	6 27 47.1	12.477
14	12 18 30.08	1.7993	3 25 8.1	12.483	14	13 45 41.07	1.8562	6 40 15.2	12.459
15	12 20 18.03	1.7991	3 12 38.6	12.499	15	13 47 32.52	1.8588	6 52 42.2	12.440
16	12 22 5.97	1.7989	3 0 8.2	12.515	16	13 49 24.13	1.8615	7 5 8.0	12.419
17	12 23 53.90	1.7987	2 47 36.8	12.530	17	13 51 15.90	1.8642	7 17 32.5	12.398
18	12 25 41.82	1.7987	2 35 4.6	12.543	18	13 53 7.83	1.8669	7 29 55.8	12.377
19	12 27 29.75	1.7988	2 22 31.6	12.557	19	13 54 59.93	1.8698	7 42 17.8	12.355
20	12 29 17.68	1.7989	2 9 57.8	12.570	20	13 56 52.21	1.8728	7 54 38.4	12.331
21	12 31 5.62	1.7991	1 57 23.2	12.582	21	13 58 44.67	1.8757	8 6 57.5	12.306
22	12 32 53.57	1.7992	1 44 47.9	12.593	22	14 0 37.30	1.8787	8 19 15.1	12.281
23	12 34 41.53	1.7995	N. 1 32 12.0	12.604	23	14 2 30.12	1.8818	S. 8 31 31.2	12.255
	SUNDAY 2.					TUESDAY 4.			
0	12 36 29.51	1.7998	N. 1 19 35.4	12.615	0	14 4 23.12	1.8849	S. 8 43 45.7	12.227
1	12 38 17.51	1.8002	1 6 58.2	12.624	1	14 6 16.31	1.8881	8 55 58.5	12.200
2	12 40 5.54	1.8007	0 54 20.5	12.632	2	14 8 9.69	1.8913	9 8 9.7	12.172
3	12 41 53.59	1.8011	0 41 42.3	12.640	3	14 10 3.27	1.8947	9 20 19.1	12.142
4	12 43 41.67	1.8017	0 29 3.7	12.647	4	14 11 57.05	1.8980	9 32 26.7	12.111
5	12 45 29.79	1.8023	0 16 24.6	12.655	5	14 13 51.03	1.9014	9 44 32.4	12.079
6	12 47 17.95	1.8030	N. 0 3 45.1	12.661	6	14 15 45.22	1.9048	9 56 36.2	12.047
7	12 49 6.15	1.8037	S. 0 8 54.7	12.666	7	14 17 39.61	1.9083	10 8 38.0	12.013
8	12 50 54.40	1.8046	0 21 34.8	12.671	8	14 19 34.22	1.9120	10 20 37.7	11.978
9	12 52 42.70	1.8054	0 34 15.2	12.675	9	14 21 29.05	1.9156	10 32 35.4	11.944
10	12 54 31.05	1.8063	0 46 55.8	12.677	10	14 23 24.09	1.9192	10 44 31.0	11.908
11	12 56 19.46	1.8073	0 59 36.5	12.680	11	14 25 19.35	1.9229	10 56 24.3	11.870
12	12 58 7.93	1.8083	1 12 17.4	12.682	12	14 27 14.84	1.9267	11 8 15.4	11.832
13	12 59 56.46	1.8094	1 24 58.3	12.682	13	14 29 10.55	1.9304	11 20 4.2	11.793
14	13 1 45.06	1.8106	1 37 39.3	12.683	14	14 31 6.49	1.9343	11 31 50.6	11.753
15	13 3 33.73	1.8118	1 50 20.3	12.682	15	14 33 2.67	1.9383	11 43 34.6	11.712
16	13 5 22.48	1.8132	2 3 1.2	12.681	16	14 34 59.09	1.9422	11 55 16.1	11.670
17	13 7 11.31	1.8145	2 15 42.0	12.678	17	14 36 55.74	1.9462	12 6 55.0	11.627
18	13 9 0.22	1.8158	2 28 22.6	12.676	18	14 38 52.64	1.9503	12 18 31.3	11.583
19	13 10 49.21	1.8172	2 41 3.1	12.672	19	14 40 49.78	1.9543	12 30 5.0	11.539
20	13 12 38.29	1.8188	2 53 43.3	12.668	20	14 42 47.16	1.9585	12 41 36.0	11.493
21	13 14 27.47	1.8204	3 6 23.3	12.663	21	14 44 44.80	1.9627	12 53 4.2	11.446
22	13 16 16.74	1.8220	3 19 2.9	12.657	22	14 46 42.69	1.9670	13 4 29.5	11.397
23	13 18 6.11	1.8237	3 31 42.2	12.651	23	14 48 40.84	1.9713	13 15 51.9	11.349
24	13 19 55.59	1.8255	S. 3 44 21.0	12.643	24	14 50 39.25	1.9757	S. 13 27 11.4	11.299

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.			Diff. for 1 Minute.	Declination.			Diff. for 1 Minute.
				WEDNESDAY 5.				
	h	m	s	s	°	'	"	"
0	14	50	39.25	1.9757	S. 13	27	11.4	11.299
1	14	52	37.92	1.9800	13	38	27.8	11.248
2	14	54	36.85	1.9843	13	49	41.2	11.197
3	14	56	36.04	1.9888	14	0	51.4	11.143
4	14	58	35.51	1.9934	14	11	58.4	11.090
5	15	0	35.25	1.9979	14	23	2.2	11.035
6	15	2	35.26	2.0024	14	34	2.6	10.978
7	15	4	35.54	2.0071	14	44	59.6	10.921
8	15	6	36.11	2.0117	14	55	53.1	10.862
9	15	8	36.95	2.0164	15	6	43.1	10.804
10	15	10	38.08	2.0212	15	17	29.6	10.744
11	15	12	39.50	2.0260	15	28	12.4	10.682
12	15	14	41.20	2.0307	15	38	51.5	10.620
13	15	16	43.19	2.0356	15	49	26.8	10.557
14	15	18	45.47	2.0405	15	59	58.3	10.492
15	15	20	48.05	2.0454	16	10	25.8	10.426
16	15	22	50.92	2.0502	16	20	49.4	10.359
17	15	24	54.08	2.0552	16	31	8.9	10.291
18	15	26	57.55	2.0603	16	41	24.3	10.222
19	15	29	1.32	2.0653	16	51	35.6	10.152
20	15	31	5.39	2.0704	17	1	42.6	10.081
21	15	33	9.77	2.0755	17	11	45.3	10.009
22	15	35	14.45	2.0806	17	21	43.7	9.936
23	15	37	19.44	2.0857	S. 17	31	37.6	9.861
				THURSDAY 6.				
0	15	39	24.74	2.0909	S. 17	41	27.0	9.785
1	15	41	30.35	2.0961	17	51	11.8	9.708
2	15	43	36.27	2.1012	18	0	52.0	9.631
3	15	45	42.50	2.1065	18	10	27.5	9.552
4	15	47	49.05	2.1117	18	19	58.2	9.472
5	15	49	55.91	2.1170	18	29	24.1	9.391
6	15	52	3.09	2.1223	18	38	45.1	9.308
7	15	54	10.59	2.1276	18	48	1.1	9.225
8	15	56	18.40	2.1328	18	57	12.1	9.140
9	15	58	26.53	2.1382	19	6	17.9	9.053
10	16	0	34.98	2.1435	19	15	18.5	8.967
11	16	2	43.75	2.1487	19	24	14.0	8.880
12	16	4	52.83	2.1541	19	33	4.1	8.790
13	16	7	2.24	2.1595	19	41	48.8	8.700
14	16	9	11.97	2.1648	19	50	28.1	8.608
15	16	11	22.02	2.1702	19	59	1.8	8.516
16	16	13	32.39	2.1755	20	7	30.0	8.422
17	16	15	43.08	2.1808	20	15	52.5	8.327
18	16	17	54.09	2.1862	20	24	9.3	8.232
19	16	20	5.42	2.1916	20	32	20.3	8.134
20	16	22	17.08	2.1969	20	40	25.4	8.036
21	16	24	29.05	2.2022	20	48	24.6	7.937
22	16	26	41.34	2.2075	20	56	17.8	7.837
23	16	28	53.95	2.2128	21	4	5.0	7.735
24	16	31	6.88	2.2182	S. 21	11	46.0	7.632

Hour.	Right Ascension.			Diff. for 1 Minute.	Declination.			Diff. for 1 Minute.
				FRIDAY 7.				
	h	m	s	s	°	'	"	"
0	16	31	6.88	2.2182	S. 21	11	46.0	7.632
1	16	33	20.13	2.2234	21	19	20.8	7.528
2	16	35	33.69	2.2287	21	26	49.4	7.423
3	16	37	47.57	2.2339	21	34	11.6	7.317
4	16	40	1.76	2.2392	21	41	27.4	7.210
5	16	42	16.27	2.2444	21	48	36.8	7.102
6	16	44	31.09	2.2497	21	55	39.7	6.993
7	16	46	46.23	2.2548	22	2	36.0	6.882
8	16	49	1.67	2.2599	22	9	25.6	6.771
9	16	51	17.42	2.2651	22	16	8.5	6.658
10	16	53	33.48	2.2702	22	22	44.6	6.545
11	16	55	49.84	2.2752	22	29	13.9	6.430
12	16	58	6.51	2.2802	22	35	36.2	6.314
13	17	0	23.47	2.2852	22	41	51.6	6.197
14	17	2	40.74	2.2902	22	47	59.9	6.079
15	17	4	58.30	2.2952	22	54	1.1	5.961
16	17	7	16.16	2.3000	22	59	55.2	5.842
17	17	9	34.30	2.3048	23	5	42.1	5.720
18	17	11	52.74	2.3097	23	11	21.6	5.597
19	17	14	11.46	2.3144	23	16	53.8	5.475
20	17	16	30.47	2.3192	23	22	18.6	5.352
21	17	18	49.76	2.3238	23	27	36.0	5.227
22	17	21	9.32	2.3283	23	32	45.8	5.100
23	17	23	29.16	2.3329	S. 23	37	48.0	4.973
				SATURDAY 8.				
0	17	25	49.27	2.3374	S. 23	42	42.6	4.846
1	17	28	9.65	2.3418	23	47	29.5	4.717
2	17	30	30.29	2.3463	23	52	8.7	4.588
3	17	32	51.20	2.3506	23	56	40.1	4.457
4	17	35	12.36	2.3547	24	1	3.6	4.326
5	17	37	33.77	2.3590	24	5	19.2	4.193
6	17	39	55.44	2.3632	24	9	26.8	4.060
7	17	42	17.35	2.3672	24	13	26.4	3.927
8	17	44	39.51	2.3712	24	17	18.0	3.792
9	17	47	1.90	2.3752	24	21	1.5	3.657
10	17	49	24.53	2.3791	24	24	36.8	3.520
11	17	51	47.39	2.3828	24	28	3.9	3.382
12	17	54	10.47	2.3865	24	31	22.7	3.244
13	17	56	33.77	2.3902	24	34	33.2	3.105
14	17	58	57.29	2.3937	24	37	35.3	2.966
15	18	1	21.02	2.3972	24	40	29.1	2.827
16	18	3	44.96	2.4007	24	43	14.5	2.685
17	18	6	9.10	2.4039	24	45	51.3	2.542
18	18	8	33.43	2.4072	24	48	19.6	2.401
19	18	10	57.96	2.4103	24	50	39.4	2.258
20	18	13	22.67	2.4134	24	52	50.6	2.115
21	18	15	47.57	2.4164	24	54	53.2	1.971
22	18	18	12.64	2.4193	24	56	47.1	1.826
23	18	20	37.89	2.4222	24	58	32.3	1.680
24	18	23	3.30	2.4248	S. 25	0	8.7	1.534

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

SUNDAY 9.

Hour.	Right Ascension.			Diff. for 1 Minute.	Declination.			Diff. for 1 Minute.
	h	m	s	s	°	′	″	″
0	18	23	3.30	2.4248	S. 25	0	8.7	1.534
1	18	25	28.87	2.4275	25	1	36.4	1.387
2	18	27	54.60	2.4300	25	2	55.2	1.240
3	18	30	20.47	2.4324	25	4	5.2	1.093
4	18	32	46.49	2.4348	25	5	6.4	0.946
5	18	35	12.65	2.4371	25	5	58.7	0.797
6	18	37	38.94	2.4392	25	6	42.1	0.648
7	18	40	5.35	2.4412	25	7	16.5	0.498
8	18	42	31.89	2.4433	25	7	41.9	0.349
9	18	44	58.55	2.4452	25	7	58.4	0.200
10	18	47	25.31	2.4469	25	8	5.9	−0.049
11	18	49	52.18	2.4486	25	8	4.3	+0.102
12	18	52	19.14	2.4502	25	7	53.7	0.252
13	18	54	46.20	2.4517	25	7	34.0	0.404
14	18	57	13.34	2.4530	25	7	5.2	0.556
15	18	59	40.56	2.4543	25	6	27.3	0.707
16	19	2	7.86	2.4556	25	5	40.3	0.859
17	19	4	35.23	2.4567	25	4	44.2	1.012
18	19	7	2.66	2.4576	25	3	38.9	1.164
19	19	9	30.14	2.4585	25	2	24.5	1.316
20	19	11	57.68	2.4593	25	1	1.0	1.468
21	19	14	25.26	2.4600	24	59	28.3	1.621
22	19	16	52.88	2.4607	24	57	46.5	1.773
23	19	19	20.54	2.4612	S. 24	55	55.5	1.927

MONDAY 10.

Hour.	Right Ascension.			Diff. for 1 Minute.	Declination.			Diff. for 1 Minute.
	h	m	s	s	°	′	″	″
0	19	21	48.22	2.4615	S. 24	53	55.3	2.079
1	19	24	15.92	2.4618	24	51	46.0	2.232
2	19	26	43.64	2.4621	24	49	27.4	2.386
3	19	29	11.37	2.4622	24	46	59.7	2.538
4	19	31	39.10	2.4622	24	44	22.9	2.690
5	19	34	6.83	2.4621	24	41	36.9	2.842
6	19	36	34.55	2.4619	24	38	41.8	2.995
7	19	39	2.26	2.4617	24	35	37.5	3.147
8	19	41	29.95	2.4613	24	32	24.1	3.300
9	19	43	57.61	2.4608	24	29	1.5	3.452
10	19	46	25.25	2.4603	24	25	29.8	3.603
11	19	48	52.85	2.4597	24	21	49.1	3.755
12	19	51	20.41	2.4589	24	17	59.2	3.907
13	19	53	47.92	2.4581	24	14	0.3	4.057
14	19	56	15.38	2.4572	24	9	52.3	4.208
15	19	58	42.79	2.4562	24	5	35.3	4.357
16	20	1	10.13	2.4552	24	1	9.4	4.507
17	20	3	37.41	2.4541	23	56	34.4	4.658
18	20	6	4.62	2.4528	23	51	50.4	4.807
19	20	8	31.75	2.4511	23	46	57.5	4.956
20	20	10	58.79	2.4500	23	41	55.7	5.104
21	20	13	25.75	2.4486	23	36	45.0	5.252
22	20	15	52.62	2.4471	23	31	25.4	5.400
23	20	18	19.40	2.4454	23	25	57.0	5.547
24	20	20	46.07	2.4437	S. 23	20	19.8	5.693

TUESDAY 11.

Hour.	Right Ascension.			Diff. for 1 Minute.	Declination.			Diff. for 1 Minute.
	h	m	s	s	°	′	″	″
0	20	20	46.07	2.4437	S. 23	20	19.8	5.693
1	20	23	12.64	2.4419	23	14	33.8	5.839
2	20	25	39.10	2.4401	23	8	39.1	5.984
3	20	28	5.45	2.4382	23	2	35.7	6.129
4	20	30	31.69	2.4362	22	56	23.6	6.273
5	20	32	57.80	2.4342	22	50	2.9	6.417
6	20	35	23.79	2.4321	22	43	33.6	6.560
7	20	37	49.65	2.4299	22	36	55.7	6.702
8	20	40	15.38	2.4277	22	30	9.3	6.844
9	20	42	40.97	2.4254	22	23	14.4	6.985
10	20	45	6.43	2.4232	22	16	11.1	7.125
11	20	47	31.75	2.4208	22	8	59.4	7.265
12	20	49	56.92	2.4182	22	1	39.3	7.403
13	20	52	21.94	2.4157	21	54	11.0	7.541
14	20	54	46.81	2.4132	21	46	34.4	7.679
15	20	57	11.53	2.4107	21	38	49.6	7.816
16	20	59	36.09	2.4080	21	30	56.6	7.950
17	21	2	0.49	2.4053	21	22	55.5	8.085
18	21	4	24.73	2.4026	21	14	46.3	8.220
19	21	6	48.80	2.3998	21	6	29.1	8.352
20	21	9	12.71	2.3972	20	58	4.0	8.484
21	21	11	36.46	2.3943	20	49	31.0	8.615
22	21	14	0.03	2.3914	20	40	50.2	8.746
23	21	16	23.43	2.3885	S. 20	32	1.5	8.876

WEDNESDAY 12.

Hour.	Right Ascension.			Diff. for 1 Minute.	Declination.			Diff. for 1 Minute.
	h	m	s	s	°	′	″	″
0	21	18	46.65	2.3856	S. 20	23	5.1	9.004
1	21	21	9.70	2.3827	20	14	1.0	9.132
2	21	23	32.57	2.3797	20	4	49.3	9.258
3	21	25	55.26	2.3767	19	55	30.0	9.384
4	21	28	17.77	2.3737	19	46	3.2	9.509
5	21	30	40.10	2.3706	19	36	28.9	9.632
6	21	33	2.24	2.3676	19	26	47.2	9.755
7	21	35	24.21	2.3646	19	16	58.2	9.877
8	21	37	45.99	2.3614	19	7	2.0	9.997
9	21	40	7.58	2.3583	18	56	58.6	10.117
10	21	42	28.99	2.3552	18	46	48.0	10.235
11	21	44	50.21	2.3521	18	36	30.4	10.352
12	21	47	11.24	2.3490	18	26	5.7	10.469
13	21	49	32.09	2.3459	18	15	34.1	10.583
14	21	51	52.75	2.3427	18	4	55.7	10.697
15	21	54	13.22	2.3396	17	54	10.4	10.811
16	21	56	33.50	2.3365	17	43	18.4	10.922
17	21	58	53.60	2.3334	17	32	19.7	11.033
18	22	1	13.51	2.3302	17	21	14.4	11.142
19	22	3	33.23	2.3272	17	10	2.6	11.251
20	22	5	52.77	2.3241	16	58	44.3	11.358
21	22	8	12.12	2.3210	16	47	19.6	11.464
22	22	10	31.29	2.3179	16	35	48.6	11.569
23	22	12	50.27	2.3148	16	24	11.3	11.672
24	22	15	9.07	2.3118	S. 16	12	27.9	11.774

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	THURSDAY 13.					SATURDAY 15.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	22 15 9.07	2.3118	S. 16 12 27.9	11.774	0	0 3 13.36	2.2089	S. 5 14 11.7	15.121
1	22 17 27.69	2.3088	16 0 38.4	11.876	1	0 5 25.87	2.2080	4 59 3.4	15.155
2	22 19 46.13	2.3057	15 48 42.8	11.976	2	0 7 38.32	2.2072	4 43 53.1	15.188
3	22 22 4.38	2.3027	15 36 41.3	12.074	3	0 9 50.73	2.2065	4 28 40.8	15.220
4	22 24 22.46	2.2998	15 24 33.9	12.172	4	0 12 3.10	2.2059	4 13 26.7	15.250
5	22 26 40.36	2.2968	15 12 20.7	12.267	5	0 14 15.44	2.2053	3 58 10.8	15.278
6	22 28 58.08	2.2939	15 0 1.8	12.362	6	0 16 27.74	2.2047	3 42 53.3	15.305
7	22 31 15.63	2.2911	14 47 37.2	12.456	7	0 18 40.01	2.2042	3 27 34.2	15.330
8	22 33 33.01	2.2882	14 35 7.1	12.548	8	0 20 52.25	2.2038	3 12 13.6	15.354
9	22 35 50.21	2.2853	14 22 31.4	12.640	9	0 23 4.47	2.2035	2 56 51.7	15.377
10	22 38 7.25	2.2826	14 9 50.3	12.730	10	0 25 16.67	2.2032	2 41 28.5	15.397
11	22 40 24.12	2.2797	13 57 3.8	12.818	11	0 27 28.86	2.2031	2 26 4.1	15.416
12	22 42 40.82	2.2769	13 44 12.1	12.905	12	0 29 41.04	2.2030	2 10 38.6	15.433
13	22 44 57.35	2.2742	13 31 15.2	12.991	13	0 31 53.22	2.2029	1 55 12.1	15.450
14	22 47 13.73	2.2716	13 18 13.2	13.076	14	0 34 5.39	2.2028	1 39 44.7	15.464
15	22 49 29.94	2.2689	13 5 6.1	13.159	15	0 36 17.56	2.2029	1 24 16.4	15.477
16	22 51 46.00	2.2663	12 51 54.1	13.240	16	0 38 29.74	2.2031	1 8 47.4	15.488
17	22 54 1.90	2.2637	12 38 37.3	13.321	17	0 40 41.93	2.2033	0 53 17.8	15.497
18	22 56 17.65	2.2612	12 25 15.6	13.401	18	0 42 54.14	2.2036	0 37 47.7	15.506
19	22 58 33.25	2.2587	12 11 49.2	13.478	19	0 45 6.36	2.2038	0 22 17.1	15.512
20	23 0 48.70	2.2563	11 58 18.2	13.555	20	0 47 18.60	2.2042	S. 0 6 46.2	15.517
21	23 3 4.01	2.2540	11 44 42.6	13.631	21	0 49 30.87	2.2047	N. 0 8 44.9	15.520
22	23 5 19.18	2.2516	11 31 2.5	13.701	22	0 51 43.17	2.2053	0 24 16.2	15.522
23	23 7 34.20	2.2493	S. 11 17 18.1	13.776	23	0 53 55.51	2.2059	N. 0 39 47.5	15.522
	FRIDAY 14.					SUNDAY 16.			
0	23 9 49.09	2.2471	S. 11 3 29.4	13.847	0	0 56 7.88	2.2065	N. 0 55 18.8	15.520
1	23 12 3.85	2.2448	10 49 36.5	13.917	1	0 58 20.29	2.2072	1 10 49.9	15.517
2	23 14 18.47	2.2426	10 35 39.4	13.985	2	1 0 32.75	2.2081	1 26 20.8	15.512
3	23 16 32.96	2.2405	10 21 38.3	14.052	3	1 2 45.26	2.2089	1 41 51.4	15.506
4	23 18 47.33	2.2384	10 7 33.2	14.117	4	1 4 57.82	2.2097	1 57 21.5	15.497
5	23 21 1.57	2.2364	9 53 24.2	14.181	5	1 7 10.43	2.2107	2 12 51.1	15.488
6	23 23 15.70	2.2345	9 39 11.5	14.243	6	1 9 23.11	2.2118	2 28 20.0	15.477
7	23 25 29.71	2.2326	9 24 55.0	14.305	7	1 11 35.85	2.2129	2 43 48.2	15.463
8	23 27 43.61	2.2307	9 10 34.9	14.364	8	1 13 48.66	2.2141	2 59 15.6	15.448
9	23 29 57.40	2.2289	8 56 11.3	14.422	9	1 16 1.54	2.2153	3 14 42.1	15.432
10	23 32 11.08	2.2271	8 41 44.2	14.480	10	1 18 14.50	2.2166	3 30 7.5	15.415
11	23 34 24.65	2.2254	8 27 13.7	14.535	11	1 20 27.53	2.2179	3 45 31.8	15.395
12	23 36 38.13	2.2238	8 12 40.0	14.588	12	1 22 40.65	2.2193	4 0 54.9	15.373
13	23 38 51.51	2.2222	7 58 3.1	14.641	13	1 24 53.85	2.2208	4 16 16.7	15.351
14	23 41 4.80	2.2207	7 43 23.1	14.692	14	1 27 7.15	2.2224	4 31 37.0	15.327
15	23 43 18.00	2.2192	7 28 40.1	14.742	15	1 29 20.54	2.2239	4 46 55.8	15.300
16	23 45 31.11	2.2178	7 13 54.1	14.789	16	1 31 34.02	2.2256	5 2 13.0	15.272
17	23 47 44.14	2.2165	6 59 5.3	14.837	17	1 33 47.61	2.2273	5 17 28.5	15.243
18	23 49 57.09	2.2152	6 44 13.7	14.882	18	1 36 1.30	2.2291	5 32 42.2	15.212
19	23 52 9.97	2.2141	6 29 19.5	14.924	19	1 38 15.10	2.2309	5 47 54.0	15.179
20	23 54 22.78	2.2129	6 14 22.7	14.967	20	1 40 29.01	2.2328	6 3 3.7	15.145
21	23 56 35.52	2.2117	5 59 23.5	15.008	21	1 42 43.04	2.2347	6 18 11.3	15.108
22	23 58 48.19	2.2107	5 44 21.9	15.047	22	1 44 57.18	2.2367	6 33 16.7	15.072
23	0 1 0.80	2.2097	5 29 17.9	15.084	23	1 47 11.44	2.2387	6 48 19.8	15.033
24	0 3 13.36	2.2089	S. 5 14 11.7	15.121	24	1 49 25.83	2.2408	N. 7 3 20.5	14.991

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	MONDAY 17.					WEDNESDAY 19.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	1 49 25.83	2.2408	N. 7 3 20.5	14.991	0	3 40 8.75	2.3806	N.17 44 42.4	11.134
1	1 51 40.34	2.2430	7 18 18.7	14.947	1	3 42 31.68	2.3837	17 55 47.0	11.017
2	1 53 54.99	2.2452	7 33 14.3	14.903	2	3 44 54.79	2.3867	18 6 44.5	10.899
3	1 56 9.77	2.2474	7 48 7.2	14.857	3	3 47 18.09	2.3898	18 17 34.9	10.780
4	1 58 24.68	2.2497	8 2 57.2	14.809	4	3 49 41.57	2.3928	18 28 18.1	10.659
5	2 0 39.74	2.2522	8 17 44.3	14.761	5	3 52 5.23	2.3958	18 38 54.0	10.537
6	2 2 54.94	2.2545	8 32 28.5	14.710	6	3 54 29.07	2.3987	18 49 22.6	10.415
7	2 5 10.28	2.2569	8 47 9.5	14.657	7	3 56 53.08	2.4017	18 59 43.8	10.291
8	2 7 25.77	2.2594	9 1 47.3	14.602	8	3 59 17.27	2.4046	19 9 57.5	10.165
9	2 9 41.41	2.2620	9 16 21.8	14.547	9	4 1 41.63	2.4075	19 20 3.6	10.038
10	2 11 57.21	2.2646	9 30 52.9	14.489	10	4 4 6.17	2.4103	19 30 2.1	9.911
11	2 14 13.16	2.2672	9 45 20.5	14.430	11	4 6 30.87	2.4130	19 39 52.9	9.782
12	2 16 29.27	2.2698	9 59 44.5	14.369	12	4 8 55.73	2.4157	19 49 36.0	9.652
13	2 18 45.54	2.2725	10 14 4.8	14.307	13	4 11 20.76	2.4185	19 59 11.2	9.521
14	2 21 1.97	2.2752	10 28 21.3	14.242	14	4 13 45.95	2.4211	20 8 38.5	9.389
15	2 23 18.57	2.2780	10 42 33.9	14.177	15	4 16 11.29	2.4237	20 17 57.9	9.257
16	2 25 35.34	2.2808	10 56 42.5	14.109	16	4 18 36.79	2.4262	20 27 9.3	9.122
17	2 27 52.27	2.2837	11 10 47.0	14.040	17	4 21 2.44	2.4287	20 36 12.6	8.987
18	2 30 9.37	2.2865	11 24 47.3	13.969	18	4 23 28.24	2.4312	20 45 7.7	8.851
19	2 32 26.65	2.2895	11 38 43.3	13.897	19	4 25 54.18	2.4335	20 53 54.7	8.714
20	2 34 44.11	2.2924	11 52 35.0	13.824	20	4 28 20.26	2.4358	21 2 33.4	8.576
21	2 37 1.74	2.2953	12 6 22.2	13.748	21	4 30 46.48	2.4381	21 11 3.8	8.437
22	2 39 19.55	2.2984	12 20 4.8	13.671	22	4 33 12.83	2.4402	21 19 25.9	8.297
23	2 41 37.54	2.3014	N.12 33 42.7	13.592	23	4 35 39.31	2.4423	N.21 27 39.5	8.157
	TUESDAY 18.					THURSDAY 20.			
0	2 43 55.72	2.3044	N.12 47 15.9	13.512	0	4 38 5.91	2.4444	N.21 35 44.7	8.016
1	2 46 14.08	2.3075	13 0 44.2	13.430	1	4 40 32.64	2.4464	21 43 41.4	7.873
2	2 48 32.62	2.3106	13 14 7.5	13.347	2	4 42 59.48	2.4483	21 51 29.5	7.730
3	2 50 51.35	2.3137	13 27 25.8	13.262	3	4 45 26.44	2.4502	21 59 9.0	7.586
4	2 53 10.27	2.3168	13 40 39.0	13.176	4	4 47 53.50	2.4519	22 6 39.8	7.441
5	2 55 29.38	2.3200	13 53 46.9	13.087	5	4 50 20.67	2.4536	22 14 1.9	7.296
6	2 57 48.67	2.3232	14 6 49.4	12.997	6	4 52 47.93	2.4552	22 21 15.3	7.151
7	3 0 8.15	2.3263	14 19 46.6	12.907	7	4 55 15.29	2.4567	22 28 20.0	7.004
8	3 2 27.82	2.3295	14 32 38.2	12.813	8	4 57 42.74	2.4582	22 35 15.8	6.857
9	3 4 47.69	2.3327	14 45 24.2	12.720	9	5 0 10.27	2.4595	22 42 2.8	6.708
10	3 7 7.75	2.3359	14 58 4.6	12.624	10	5 2 37.88	2.4608	22 48 40.8	6.560
11	3 9 28.00	2.3391	15 10 39.1	12.527	11	5 5 5.57	2.4620	22 55 10.0	6.412
12	3 11 48.44	2.3423	15 23 7.8	12.428	12	5 7 33.32	2.4631	23 1 30.2	6.262
13	3 14 9.08	2.3456	15 35 30.5	12.328	13	5 10 1.14	2.4642	23 7 41.4	6.112
14	3 16 29.91	2.3487	15 47 47.2	12.227	14	5 12 29.02	2.4651	23 13 43.6	5.961
15	3 18 50.93	2.3519	15 59 57.7	12.123	15	5 14 56.95	2.4659	23 19 36.7	5.810
16	3 21 12.14	2.3552	16 12 2.0	12.019	16	5 17 24.93	2.4667	23 25 20.8	5.659
17	3 23 33.55	2.3584	16 24 0.0	11.913	17	5 19 52.95	2.4673	23 30 55.8	5.507
18	3 25 55.15	2.3616	16 35 51.6	11.806	18	5 22 21.01	2.4678	23 36 21.6	5.354
19	3 28 16.94	2.3647	16 47 36.7	11.697	19	5 24 49.09	2.4683	23 41 38.3	5.202
20	3 30 38.92	2.3679	16 59 15.3	11.588	20	5 27 17.20	2.4687	23 46 45.9	5.050
21	3 33 1.09	2.3712	17 10 47.3	11.477	21	5 29 45.33	2.4689	23 51 44.3	4.897
22	3 35 23.46	2.3743	17 22 12.5	11.363	22	5 32 13.47	2.4691	23 56 33.5	4.743
23	3 37 46.01	2.3774	17 33 30.9	11.249	23	5 34 41.62	2.4692	24 1 13.5	4.589
24	3 40 8.75	2.3806	N.17 44 42.4	11.134	24	5 37 9.77	2.4692	N.24 5 44.2	4.435

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	FRIDAY 21.					SUNDAY 23.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	5 37 9.77	2.4692	N.24 5 44.2	4.435	0	7 33 42.84	2.3507	N.24 43 59.9	2.678
1	5 39 37.92	2.4690	24 10 5.7	4.282	1	7 36 3.75	2.3462	24 41 15.2	2.812
2	5 42 6.05	2.4687	24 14 18.0	4.127	2	7 38 24.38	2.3416	24 38 22.5	2.945
3	5 44 34.17	2.4684	24 18 21.0	3.973	3	7 40 44.74	2.3369	24 35 21.8	3.077
4	5 47 2.26	2.4679	24 22 14.8	3.820	4	7 43 4.81	2.3321	24 32 13.3	3.207
5	5 49 30.32	2.4674	24 25 59.4	3.665	5	7 45 24.59	2.3273	24 28 56.9	3.338
6	5 51 58.35	2.4667	24 29 34.6	3.510	6	7 47 44.09	2.3225	24 25 32.7	3.467
7	5 54 26.33	2.4660	24 33 0.6	3.356	7	7 50 3.29	2.3176	24 22 0.8	3.596
8	5 56 54.27	2.4652	24 36 17.3	3.202	8	7 52 22.20	2.3127	24 18 21.2	3.723
9	5 59 22.15	2.4642	24 39 24.8	3.047	9	7 54 40.81	2.3077	24 14 34.0	3.849
10	6 1 49.97	2.4632	24 42 23.0	2.892	10	7 56 59.12	2.3026	24 10 39.3	3.974
11	6 4 17.73	2.4620	24 45 11.9	2.738	11	7 59 17.12	2.2975	24 6 37.1	4.098
12	6 6 45.41	2.4607	24 47 51.6	2.585	12	8 1 34.82	2.2924	24 2 27.5	4.222
13	6 9 13.01	2.4593	24 50 22.1	2.431	13	8 3 52.21	2.2872	23 58 10.5	4.345
14	6 11 40.53	2.4578	24 52 43.3	2.277	14	8 6 9.29	2.2820	23 53 46.1	4.467
15	6 14 7.95	2.4562	24 54 55.3	2.123	15	8 8 26.05	2.2767	23 49 14.5	4.587
16	6 16 35.28	2.4546	24 56 58.1	1.971	16	8 10 42.50	2.2715	23 44 35.7	4.707
17	6 19 2.50	2.4528	24 58 51.8	1.817	17	8 12 58.63	2.2662	23 39 49.7	4.826
18	6 21 29.61	2.4509	25 0 36.2	1.664	18	8 15 14.44	2.2607	23 34 56.6	4.943
19	6 23 56.61	2.4489	25 2 11.5	1.512	19	8 17 29.92	2.2554	23 29 56.5	5.059
20	6 26 23.48	2.4467	25 3 37.7	1.361	20	8 19 45.09	2.2501	23 24 49.5	5.175
21	6 28 50.22	2.4446	25 4 54.8	1.209	21	8 21 59.93	2.2446	23 19 35.5	5.290
22	6 31 16.83	2.4423	25 6 2.8	1.057	22	8 24 14.44	2.2392	23 14 14.7	5.403
23	6 33 43.30	2.4399	N.25 7 1.7	0.906	23	8 26 28.63	2.2337	N.23 8 47.1	5.516
	SATURDAY 22.					MONDAY 24.			
0	6 36 9.62	2.4373	N.25 7 51.5	0.755	0	8 28 42.49	2.2282	N.23 3 12.8	5.627
1	6 38 35.78	2.4347	25 8 32.3	0.605	1	8 30 56.02	2.2227	22 57 31.8	5.737
2	6 41 1.79	2.4320	25 9 4.1	0.456	2	8 33 9.22	2.2172	22 51 44.3	5.847
3	6 43 27.64	2.4293	25 9 27.0	0.307	3	8 35 22.08	2.2117	22 45 50.2	5.956
4	6 45 53.31	2.4264	25 9 40.9	0.158	4	8 37 34.62	2.2062	22 39 49.6	6.063
5	6 48 18.81	2.4234	25 9 46.0	+0.010	5	8 39 46.82	2.2006	22 33 42.6	6.170
6	6 50 44.12	2.4203	25 9 42.1	−0.138	6	8 41 58.69	2.1950	22 27 29.2	6.275
7	6 53 9.25	2.4172	25 9 29.4	0.285	7	8 44 10.22	2.1894	22 21 9.6	6.379
8	6 55 34.19	2.4140	25 9 7.9	0.431	8	8 46 21.42	2.1838	22 14 43.7	6.482
9	6 57 58.93	2.4106	25 8 37.7	0.577	9	8 48 32.28	2.1782	22 8 11.7	6.584
10	7 0 23.46	2.4072	25 7 58.7	0.722	10	8 50 42.81	2.1727	22 1 33.6	6.686
11	7 2 47.79	2.4037	25 7 11.0	0.867	11	8 52 53.01	2.1672	21 54 49.4	6.787
12	7 5 11.90	2.4000	25 6 14.7	1.010	12	8 55 2.87	2.1616	21 47 59.2	6.886
13	7 7 35.79	2.3963	25 5 9.8	1.153	13	8 57 12.40	2.1560	21 41 3.1	6.983
14	7 9 59.46	2.3926	25 3 56.3	1.296	14	8 59 21.59	2.1504	21 34 1.1	7.081
15	7 12 22.90	2.3887	25 2 34.3	1.437	15	9 1 30.45	2.1449	21 26 53.3	7.177
16	7 14 46.11	2.3848	25 1 3.8	1.579	16	9 3 38.98	2.1394	21 19 39.8	7.272
17	7 17 9.08	2.3808	24 59 24.8	1.719	17	9 5 47.18	2.1338	21 12 20.7	7.366
18	7 19 31.81	2.3767	24 57 37.5	1.858	18	9 7 55.04	2.1283	21 4 56.0	7.460
19	7 21 54.29	2.3726	24 55 41.8	1.997	19	9 10 2.58	2.1228	20 57 25.7	7.552
20	7 24 16.52	2.3683	24 53 37.8	2.135	20	9 12 9.78	2.1173	20 49 49.8	7.642
21	7 26 38.49	2.3641	24 51 25.6	2.272	21	9 14 16.66	2.1118	20 42 8.5	7.732
22	7 29 0.21	2.3597	24 49 5.2	2.408	22	9 16 23.20	2.1063	20 34 21.9	7.822
23	7 31 21.66	2.3552	24 46 36.6	2.544	23	9 18 29.42	2.1009	20 26 29.9	7.910
24	7 33 42.84	2.3507	N.24 43 59.9	2.678	24	9 20 35.31	2.0955	N.20 18 32.7	7.997

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	TUESDAY 25.					THURSDAY 27.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	9 20 35.31	2.0955	N.20 18 32.7	7.997	0	10 55 34.95	1.8800	N.12 31 51.5	11.119
1	9 22 40.88	2.0901	20 10 30.3	8.083	1	10 57 27.65	1.8767	12 20 43.0	11.164
2	9 24 46.12	2.0847	20 2 22.7	8.168	2	10 59 20.16	1.8735	12 9 31.8	11.209
3	9 26 51.05	2.0794	19 54 10.1	8.252	3	11 1 12.47	1.8703	11 58 17.9	11.253
4	9 28 55.65	2.0740	19 45 52.4	8.336	4	11 3 4.60	1.8673	11 47 1.4	11.296
5	9 30 59.93	2.0687	19 37 29.8	8.417	5	11 4 56.55	1.8543	11 35 42.4	11.338
6	9 33 3.90	2.0635	19 29 2.3	8.499	6	11 6 48.32	1.8613	11 24 20.8	11.380
7	9 35 7.55	2.0582	19 20 29.9	8.580	7	11 8 39.91	1.8584	11 12 56.8	11.421
8	9 37 10.89	2.0530	19 11 52.7	8.659	8	11 10 31.33	1.8556	11 1 30.3	11.462
9	9 39 13.91	2.0478	19 3 10.8	8.737	9	11 12 22.58	1.8528	10 50 1.4	11.501
10	9 41 16.63	2.0427	18 54 24.2	8.815	10	11 14 13.67	1.8502	10 38 30.2	11.540
11	9 43 19.04	2.0376	18 45 33.0	8.892	11	11 16 4.60	1.8475	10 26 56.7	11.578
12	9 45 21.14	2.0325	18 36 37.2	8.967	12	11 17 55.37	1.8449	10 15 20.9	11.615
13	9 47 22.94	2.0274	18 27 36.9	9.042	13	11 19 45.99	1.8424	10 3 42.8	11.652
14	9 49 24.43	2.0224	18 18 32.2	9.115	14	11 21 36.46	1.8399	9 52 2.5	11.689
15	9 51 25.63	2.0175	18 9 23.1	9.188	15	11 23 26.78	1.8375	9 40 20.1	11.724
16	9 53 26.53	2.0126	18 0 9.6	9.261	16	11 25 16.96	1.8352	9 28 35.6	11.758
17	9 55 27.14	2.0077	17 50 51.8	9.332	17	11 27 7.01	1.8330	9 16 49.1	11.792
18	9 57 27.46	2.0028	17 41 29.8	9.402	18	11 28 56.92	1.8307	9 5 0.5	11.827
19	9 59 27.48	1.9980	17 32 3.6	9.472	19	11 30 46.70	1.8286	8 53 9.9	11.860
20	10 1 27.22	1.9933	17 22 33.2	9.540	20	11 32 36.35	1.8265	8 41 17.3	11.892
21	10 3 26.68	1.9886	17 12 58.8	9.607	21	11 34 25.88	1.8245	8 29 22.8	11.923
22	10 5 25.85	1.9838	17 3 20.4	9.673	22	11 36 15.29	1.8226	8 17 26.5	11.954
23	10 7 24.74	1.9792	N.16 53 38.0	9.740	23	11 38 4.59	1.8207	N. 8 5 28.3	11.985
	WEDNESDAY 26.					FRIDAY 28.			
0	10 9 23.36	1.9747	N.16 43 51.6	9.805	0	11 39 53.78	1.8189	N 7 53 28.3	12.014
1	10 11 21.70	1.9701	16 34 1.4	9.868	1	11 41 42.86	1.8172	7 41 26.6	12.043
2	10 13 19.77	1.9657	16 24 7.4	9.932	2	11 43 31.84	1.8155	7 29 23.1	12.072
3	10 15 17.58	1.9612	16 14 9.6	9.994	3	11 45 20.72	1.8138	7 17 18.0	12.099
4	10 17 15.12	1.9567	16 4 8.1	10.056	4	11 47 9.50	1.8122	7 5 11.2	12.127
5	10 19 12.39	1.9524	15 54 2.9	10.117	5	11 48 58.19	1.8107	6 53 2.8	12.153
6	10 21 9.41	1.9482	15 43 54.1	10.177	6	11 50 46.79	1.8093	6 40 52.8	12.179
7	10 23 6.17	1.9439	15 33 41.7	10.236	7	11 52 35.31	1.8080	6 28 41.3	12.204
8	10 25 2.68	1.9397	15 23 25.8	10.294	8	11 54 23.75	1.8067	6 16 28.3	12.228
9	10 26 58.93	1.9355	15 13 6.4	10.351	9	11 56 12.11	1.8054	6 4 13.9	12.252
10	10 28 54.94	1.9315	15 2 43.6	10.407	10	11 58 0.40	1.8042	5 51 58.0	12.276
11	10 30 50.71	1.9274	14 52 17.5	10.464	11	11 59 48.62	1.8032	5 39 40.8	12.298
12	10 32 46.23	1.9234	14 41 48.0	10.519	12	12 1 36.78	1.8022	5 27 22.2	12.321
13	10 34 41.52	1.9195	14 31 15.2	10.573	13	12 3 24.88	1.8012	5 15 2.3	12.342
14	10 36 36.57	1.9156	14 20 39.2	10.627	14	12 5 12.92	1.8002	5 2 41.2	12.362
15	10 38 31.39	1.9117	14 10 0.0	10.679	15	12 7 0.91	1.7994	4 50 18.8	12.382
16	10 40 25.98	1.9080	13 59 17.7	10.731	16	12 8 48.85	1.7987	4 37 55.3	12.402
17	10 42 20.35	1.9043	13 48 32.3	10.782	17	12 10 36.75	1.7979	4 25 30.6	12.421
18	10 44 14.50	1.9007	13 37 43.8	10.833	18	12 12 24.60	1.7972	4 13 4.8	12.439
19	10 46 8.43	1.8971	13 26 52.3	10.883	19	12 14 12.42	1.7967	4 0 37.9	12.457
20	10 48 2.15	1.8936	13 15 57.8	10.932	20	12 16 0.21	1.7962	3 48 10.0	12.474
21	10 49 55.66	1.8901	13 5 0.5	10.980	21	12 17 47.97	1.7957	3 35 41.0	12.491
22	10 51 48.96	1.8866	12 54 0.3	11.027	22	12 19 35.70	1.7953	3 23 11.1	12.506
23	10 53 42.05	1.8832	12 42 57.3	11.073	23	12 21 23.41	1.7950	3 10 40.3	12.521
24	10 55 34.95	1.8800	N.12 31 51.5	11.119	24	12 23 11.10	1.7947	N. 2 58 8.6	12.536

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

SATURDAY 29.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	12 23 11.10	1.7947	N. 2 58 8.6	12.536
1	12 24 58.78	1.7946	2 45 36.0	12.549
2	12 26 46.45	1.7945	2 33 2.6	12.562
3	12 28 34.12	1.7945	2 20 28.5	12.575
4	12 30 21.79	1.7945	2 7 53.6	12.587
5	12 32 9.46	1.7945	1 55 18.0	12.598
6	12 33 57.13	1.7947	1 42 41.8	12.609
7	12 35 44.82	1.7950	1 30 4.9	12.620
8	12 37 32.53	1.7952	1 17 27.4	12.629
9	12 39 20.25	1.7955	1 4 49.4	12.638
10	12 41 8.00	1.7960	0 52 10.8	12.647
11	12 42 55.77	1.7965	0 39 31.8	12.653
12	12 44 43.57	1.7970	0 26 52.4	12.660
13	12 46 31.41	1.7977	0 14 12.6	12.667
14	12 48 19.29	1.7983	N. 0 1 32.4	12.672
15	12 50 7.21	1.7990	S. 0 11 8.1	12.677
16	12 51 55.18	1.7998	0 23 48.8	12.682
17	12 53 43.20	1.8007	0 36 29.8	12.685
18	12 55 31.27	1.8017	0 49 11.0	12.687
19	12 57 19.40	1.8027	1 1 52.3	12.690
20	12 59 7.60	1.8038	1 14 33.8	12.692
21	13 0 55.86	1.8049	1 27 15.3	12.692
22	13 2 44.19	1.8062	1 39 56.9	12.693
23	13 4 32.60	1.8075	S. 1 52 38.5	12.692

SUNDAY 30.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	13 6 21.09	1.8088	S. 2 5 20.0	12.691
1	13 8 9.66	1.8102	2 18 1.4	12.689
2	13 9 58.32	1.8117	2 30 42.7	12.687
3	13 11 47.07	1.8132	2 43 23.8	12.683
4	13 13 35.91	1.8148	2 56 4.7	12.679
5	13 15 24.85	1.8166	3 8 45.3	12.675
6	13 17 13.90	1.8183	3 21 25.7	12.670
7	13 19 3.05	1.8201	3 34 5.7	12.663
8	13 20 52.31	1.8220	3 46 45.3	12.657
9	13 22 41.69	1.8239	3 59 24.5	12.650
10	13 24 31.18	1.8259	4 12 3.3	12.642
11	13 26 20.80	1.8280	4 24 41.5	12.632
12	13 28 10.54	1.8301	4 37 19.2	12.622
13	13 30 0.41	1.8323	4 49 56.2	12.612
14	13 31 50.42	1.8346	5 2 32.6	12.601
15	13 33 40.57	1.8369	5 15 8.3	12.589
16	13 35 30.86	1.8393	5 27 43.3	12.577
17	13 37 21.29	1.8418	5 40 17.5	12.563
18	13 39 11.87	1.8443	5 52 50.8	12.548
19	13 41 2.61	1.8469	6 5 23.3	12.533
20	13 42 53.50	1.8495	6 17 54.9	12.518
21	13 44 44.55	1.8522	6 30 25.5	12.501
22	13 46 35.77	1.8551	6 42 55.0	12.483
23	13 48 27.16	1.8579	6 55 23.5	12.466
24	13 50 18.72	1.8608	S. 7 7 50.9	12.447

MONDAY 31.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	13 50 18.72	1.8608	S. 7 7 50.9	12.447
1	13 52 10.46	1.8638	7 20 17.1	12.427
2	13 54 2.38	1.8668	7 32 42.1	12.406
3	13 55 54.48	1.8700	7 45 5.8	12.384
4	13 57 46.77	1.8732	7 57 28.2	12.362
5	13 59 39.26	1.8764	8 9 49.2	12.338
6	14 1 31.94	1.8797	8 22 8.8	12.315
7	14 3 24.82	1.8830	8 34 27.0	12.290
8	14 5 17.90	1.8864	8 46 43.6	12.263
9	14 7 11.19	1.8899	8 58 58.6	12.237
10	14 9 4.69	1.8934	9 11 12.0	12.210
11	14 10 58.40	1.8970	9 23 23.8	12.182
12	14 12 52.33	1.9007	9 35 33.8	12.152
13	14 14 46.48	1.9044	9 47 42.0	12.122
14	14 16 40.86	1.9082	9 59 48.4	12.091
15	14 18 35.46	1.9119	10 11 52.9	12.059
16	14 20 30.29	1.9158	10 23 55.5	12.026
17	14 22 25.36	1.9198	10 35 56.0	11.992
18	14 24 20.67	1.9238	10 47 54.4	11.957
19	14 26 16.22	1.9279	10 59 50.7	11.921
20	14 28 12.02	1.9321	11 11 44.9	11.884
21	14 30 8.07	1.9362	11 23 36.9	11.847
22	14 32 4.37	1.9404	11 35 26.6	11.808
23	14 34 0.92	1.9447	S. 11 47 13.9	11.768

TUESDAY, JUNE 1.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	14 35 57.74	1.9492	S. 11 58 58.8	11.727

PHASES OF THE MOON.

			d	h	m
○	Full Moon	May	5	0	7.8
☾	Last Quarter		12	9	45.3
●	New Moon		19	1	42.0
☽	First Quarter		26	13	27.8

			d	h
☾	Perigee	May	16	8.5
☾	Apogee		28	5.4

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	III^{h}	P. L. of Diff.	VI^{h}	P. L. of Diff.	IX^{h}	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
1	Aldebaran	W.	107 47 16	3085	109 15 44	3082	110 44 15	3079	112 12 50	3076
	Pollux	W.	63 37 27	3080	65 6 0	3077	66 34 38	3073	68 3 20	3069
	Regulus	W.	27 43 41	3126	29 11 19	3119	30 39 5	3111	32 7 1	3104
	JUPITER	W.	21 42 41	3132	23 10 12	3123	24 37 53	3114	26 5 45	3105
	Antares	E.	73 6 23	3089	71 38 0	3087	70 9 35	3084	68 41 6	3081
	a Aquilæ	E.	116 40 51	4049	115 30 0	4022	114 18 42	3997	113 6 59	3973
2	Pollux	W.	75 28 4	3048	76 57 17	3043	78 26 37	3037	79 56 4	3031
	Regulus	W.	39 28 50	3069	40 57 37	3063	42 26 32	3056	43 55 36	3048
	JUPITER	W.	33 27 33	3069	34 56 21	3062	36 25 17	3054	37 54 23	3047
	Antares	E.	61 17 41	3063	59 48 46	3059	58 19 46	3054	56 50 40	3049
	a Aquilæ	E.	107 2 51	3871	105 49 2	3854	104 34 56	3838	103 20 33	3822
3	Pollux	W.	87 25 8	3001	88 55 20	2994	90 25 40	2987	91 56 9	2980
	Regulus	W.	51 23 8	3013	52 53 5	3005	54 23 11	2997	55 53 27	2989
	JUPITER	W.	45 22 1	3012	46 51 59	3004	48 22 7	2997	49 52 24	2989
	Antares	E.	49 23 42	3025	47 54 0	3020	46 24 12	3014	44 54 17	3009
	a Aquilæ	E.	97 4 52	3757	95 49 5	3746	94 33 7	3736	93 16 58	3727
	MARS	E.	115 48 36	3241	114 23 15	3233	112 57 45	3225	111 32 6	3217
4	Pollux	W.	99 30 49	2943	101 2 13	2936	102 33 46	2928	104 5 29	2920
	Regulus	W.	63 27 13	2950	64 58 28	2942	66 29 54	2934	68 1 30	2926
	JUPITER	W.	57 26 13	2950	58 57 28	2942	60 28 53	2934	62 0 29	2926
	Antares	E.	37 23 13	2987	35 52 43	2983	34 22 9	2980	32 51 31	2978
	a Aquilæ	E.	86 54 3	3692	85 37 7	3688	84 20 7	3684	83 3 3	3681
	MARS	E.	104 21 31	3178	102 54 56	3170	101 28 11	3162	100 1 16	3153
5	Pollux	W.	111 46 37	2880	113 19 21	2872	114 52 15	2864	116 25 20	2856
	Regulus	W.	75 42 7	2883	77 14 47	2875	78 47 37	2867	80 20 39	2859
	JUPITER	W.	69 41 3	2885	71 13 41	2876	72 46 30	2868	74 19 30	2859
	Spica	W.	22 13 29	3046	23 42 45	3018	25 12 36	2993	26 42 58	2970
	a Aquilæ	E.	76 37 18	3681	75 20 11	3685	74 3 8	3690	72 46 10	3696
	MARS	E.	92 44 4	3110	91 16 6	3101	89 47 58	3092	88 19 38	3083
6	Regulus	W.	88 8 31	2815	89 42 39	2807	91 16 58	2798	92 51 29	2790
	JUPITER	W.	82 7 14	2817	83 41 20	2808	85 15 37	2800	86 50 5	2792
	Spica	W.	34 21 10	2882	35 53 52	2867	37 26 53	2853	39 0 12	2841
	a Aquilæ	E.	66 23 28	3749	65 7 33	3765	63 51 54	3783	62 36 34	3804
	MARS	E.	80 55 17	3038	79 25 52	3029	77 56 15	3020	76 26 27	3011
	a Pegasi	E.	113 17 21	3294	111 53 2	3276	110 28 22	3258	109 3 21	3240
7	Regulus	W.	100 46 48	2747	102 22 26	2738	103 58 15	2730	105 34 15	2721
	JUPITER	W.	94 45 12	2749	96 20 47	2741	97 56 33	2732	99 32 31	2723
	Spica	W.	46 50 48	2781	48 25 41	2770	50 0 49	2760	51 36 10	2749
	a Aquilæ	E.	56 26 13	3951	55 13 45	3991	54 1 57	4036	52 50 53	4086
	MARS	E.	68 54 38	2965	67 23 42	2956	65 52 35	2947	64 21 16	2939
	a Pegasi	E.	101 53 22	3164	100 26 29	3151	98 59 21	3138	97 31 58	3126
8	Regulus	W.	113 37 6	2679	115 14 14	2671	116 51 33	2663	118 29 3	2654
	JUPITER	W.	107 35 10	2681	109 12 16	2672	110 49 33	2664	112 27 1	2655
	Spica	W.	59 36 25	2698	61 13 8	2688	62 50 4	2678	64 27 14	2669
	MARS	E.	56 41 51	2893	55 9 23	2884	53 36 44	2875	52 3 53	2866

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XV^h	P. L. of Diff.	XVIII^h	P. L. of Diff.	XXI^h	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
1	Aldebaran	W.	113 41 28	3073	115 10 10	3069	116 38 57	3065	118 7 49	3061
	Pollux	W.	69 32 7	3065	71 0 59	3061	72 29 55	3057	73 58 57	3053
	Regulus	W.	33 35 6	3097	35 3 19	3090	36 31 41	3083	38 0 11	3076
	JUPITER	W.	27 33 48	3097	29 2 1	3090	30 30 22	3082	31 58 53	3075
	Antares	E.	67 12 34	3078	65 43 58	3074	64 15 17	3070	62 46 31	3067
	a Aquilæ	E.	111 54 53	3950	110 42 24	3928	109 29 33	3908	108 16 22	3889
2	Pollux	W.	81 25 38	3025	82 55 20	3020	84 25 8	3014	85 55 4	3007
	Regulus	W.	45 24 49	3041	46 54 11	3034	48 23 41	3027	49 53 20	3020
	JUPITER	W.	39 23 37	3040	40 53 0	3033	42 22 31	3026	43 52 12	3019
	Antares	E.	55 21 28	3044	53 52 10	3040	52 22 47	3035	50 53 18	3030
	a Aquilæ	E.	102 5 53	3807	100 50 58	3794	99 35 50	3781	98 20 28	3768
3	Pollux	W.	93 26 47	2973	94 57 34	2965	96 28 30	2958	97 59 35	2951
	Regulus	W.	57 23 53	2982	58 54 28	2974	60 25 13	2966	61 56 8	2958
	JUPITER	W.	51 22 50	2981	52 53 26	2973	54 24 12	2965	55 55 8	2958
	Antares	E.	43 24 16	3005	41 54 9	3000	40 23 56	2995	38 53 37	2991
	a Aquilæ	E.	92 0 39	3718	90 44 12	3710	89 27 36	3703	88 10 53	3697
	MARS	E.	110 6 17	3210	108 40 20	3202	107 14 13	3194	105 47 57	3186
4	Pollux	W.	105 37 23	2912	107 9 26	2904	108 41 39	2896	110 14 3	2888
	Regulus	W.	69 33 16	2917	71 5 13	2909	72 37 20	2901	74 9 38	2892
	JUPITER	W.	63 32 15	2918	65 4 11	2909	66 36 18	2901	68 8 35	2893
	Antares	E.	31 20 50	2976	29 50 7	2974	28 19 22	2974	26 48 37	2976
	a Aquilæ	E.	81 45 56	3679	80 28 47	3678	79 11 37	3678	77 54 27	3679
	MARS	E.	98 34 10	3144	97 6 54	3136	95 39 28	3127	94 11 51	3119
5	Pollux	W.	117 58 36	2848	119 32 2	2840	121 5 38	2832	122 39 25	2824
	Regulus	W.	81 53 51	2850	83 27 14	2841	85 0 48	2832	86 34 34	2824
	JUPITER	W.	75 52 41	2851	77 26 3	2843	78 59 35	2834	80 33 19	2825
	Spica	W.	28 13 48	2949	29 45 4	2930	31 16 45	2913	32 48 48	2897
	a Aquilæ	E.	71 29 19	3703	70 12 35	3712	68 56 1	3723	67 39 38	3735
	MARS	E.	86 51 8	3074	85 22 27	3065	83 53 35	3056	82 24 32	3047
6	Regulus	W.	94 26 10	2781	96 1 3	2773	97 36 6	2764	99 11 21	2755
	JUPITER	W.	88 24 44	2783	89 59 34	2775	91 34 35	2766	93 9 48	2757
	Spica	W.	40 33 47	2828	42 7 38	2816	43 41 46	2804	45 16 9	2792
	a Aquilæ	E.	61 21 37	3828	60 7 4	3853	58 52 56	3882	57 39 17	3915
	MARS	E.	74 56 28	3002	73 26 17	2993	71 55 56	2984	70 25 23	2974
	a Pegasi	E.	107 37 59	3223	106 12 17	3208	104 46 17	3193	103 19 58	3178
7	Regulus	W.	107 10 27	2713	108 46 50	2704	110 23 24	2696	112 0 9	2687
	JUPITER	W.	101 8 40	2715	102 45 1	2707	104 21 32	2698	105 58 15	2689
	Spica	W.	53 11 46	2738	54 47 35	2728	56 23 38	2717	57 59 55	2707
	a Aquilæ	E.	51 40 38	4141	50 31 16	4202	49 22 53	4270	48 15 33	4344
	MARS	E.	62 49 46	2930	61 18 5	2920	59 46 12	2911	58 14 7	2902
	a Pegasi	E.	96 4 20	3115	94 36 29	3105	93 8 25	3095	91 40 9	3085
8	Regulus	W.	120 6 45	2646	121 44 38	2638	123 22 42	2629	125 0 57	2621
	JUPITER	W.	114 4 41	2646	115 42 33	2638	117 20 35	2630	118 58 49	2621
	Spica	W.	66 4 36	2659	67 42 11	2649	69 19 59	2639	70 58 0	2629
	MARS	E.	50 30 51	2857	48 57 37	2848	47 24 12	2839	45 50 35	2830

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	$\mathrm{III^h}$	P. L. of Diff.	$\mathrm{VI^h}$	P. L. of Diff.	$\mathrm{IX^h}$	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
8	*a* Pegasi	E.	90 11 41	3076	88 43 2	3068	87 14 14	3060	85 45 16	3053
	SATURN	E.	115 6 57	2706	113 30 25	2696	111 53 40	2687	110 16 43	2678
9	Spica	W.	72 36 15	2620	74 14 43	2611	75 53 23	2601	77 32 17	2592
	Antares	W.	26 50 30	2679	28 27 38	2661	30 5 10	2645	31 43 4	2630
	MARS	E.	44 16 46	2821	42 42 46	2813	41 8 35	2804	39 34 13	2795
	a Pegasi	E.	78 18 31	3028	76 48 53	3026	75 19 12	3024	73 49 28	3022
	SATURN	E.	102 8 57	2633	100 30 47	2624	98 52 25	2615	97 13 50	2606
	SUN	E.	132 57 19	2929	131 25 37	2919	129 53 43	2909	128 21 36	2899
10	Spica	W.	85 49 54	2545	87 30 4	2536	89 10 27	2527	90 51 3	2518
	Antares	W.	39 57 24	2564	41 37 9	2551	43 17 11	2539	44 57 30	2528
	MARS	E.	31 39 30	2754	30 4 1	2746	28 28 22	2739	26 52 33	2732
	a Pegasi	E.	66 20 39	3029	64 51 2	3034	63 21 31	3041	61 52 9	3049
	SATURN	E.	88 57 46	2559	87 17 55	2550	85 37 52	2540	83 57 35	2531
	SUN	E.	120 37 45	2848	119 4 20	2838	117 30 41	2828	115 56 49	2818
11	Spica	W.	99 17 13	2472	100 59 6	2463	102 41 11	2454	104 23 29	2445
	Antares	W.	53 22 57	2473	55 4 48	2462	56 46 54	2452	58 29 15	2442
	SATURN	E.	75 32 55	2485	73 51 20	2475	72 9 32	2465	70 27 30	2456
	SUN	E.	108 4 11	2766	106 28 59	2756	104 53 34	2746	103 17 55	2735
12	Antares	W.	67 4 35	2391	68 48 22	2382	70 32 23	2372	72 16 38	2362
	SATURN	E.	61 54 1	2409	60 10 39	2400	58 27 5	2391	56 43 17	2381
	SUN	E.	95 16 16	2685	93 39 16	2674	92 2 2	2664	90 24 35	2655
13	Antares	W.	81 1 19	2316	82 46 55	2307	84 32 44	2298	86 18 46	2290
	a Aquilæ	W.	44 24 30	4228	45 32 30	4101	46 42 31	3987	47 54 23	3884
	SATURN	E.	48 1 0	2337	46 15 55	2329	44 30 38	2321	42 45 8	2313
	SUN	E.	82 13 57	2606	80 35 10	2597	78 56 11	2588	77 16 59	2578
14	Antares	W.	95 11 57	2251	96 59 9	2243	98 46 32	2236	100 34 6	2230
	a Aquilæ	W.	54 17 32	3486	55 38 12	3425	57 0 0	3370	58 22 51	3318
	MARS	W.	21 36 23	2466	23 18 24	2454	25 0 42	2443	26 43 15	2433
	SATURN	E.	33 54 51	2276	32 8 16	2269	30 21 31	2263	28 34 37	2258
	SUN	E.	68 57 54	2535	67 17 30	2528	65 36 56	2520	63 56 11	2513
15	Antares	W.	109 34 11	2202	111 22 36	2197	113 11 8	2193	114 59 46	2190
	a Aquilæ	W.	65 30 29	3120	66 58 14	3090	68 26 35	3062	69 55 31	3037
	MARS	W.	35 19 21	2391	37 3 8	2385	38 47 4	2379	40 31 9	2374
	SUN	E.	55 30 2	2482	53 48 22	2477	52 6 36	2472	50 24 42	2467
16	*a* Aquilæ	W.	77 26 54	2948	78 58 12	2936	80 29 45	2927	82 1 30	2919
	MARS	W.	49 13 13	2355	50 57 53	2352	52 42 37	2350	54 27 23	2349
	SUN	E.	41 53 51	2451	40 11 29	2450	38 29 5	2449	36 46 40	2448
17	*a* Aquilæ	W.	89 41 55	2908	91 14 4	2911	92 46 8	2916	94 18 6	2923
	MARS	W.	63 11 24	2351	64 56 9	2353	66 40 51	2356	68 25 29	2359
	SUN	E.	28 14 39	2455	26 32 22	2458	24 50 10	2462	23 8 4	2468
21	SUN	W.	25 1 48	2789	26 36 30	2804	28 10 53	2820	29 44 55	2837
	Regulus	E.	63 46 19	2478	62 4 35	2495	60 23 15	2512	58 42 18	2529

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh	P. L. of Diff.	XVIIIh	P. L. of Diff.	XXIh	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
8	α Pegasi	E.	84 16 9	3047	82 46 54	3042	81 17 33	3036	79 48 5	3031
	SATURN	E.	108 39 34	2669	107 2 13	2660	105 24 40	2651	103 46 55	2642
9	Spica	W.	79 11 23	2583	80 50 42	2574	82 30 13	2564	84 9 57	2555
	Antares	W.	33 21 18	2615	34 59 52	2601	36 38 45	2588	38 17 56	2576
	MARS	E.	37 59 39	2786	36 24 53	2778	34 49 56	2770	33 14 48	2762
	α Pegasi	E.	72 19 41	3020	70 49 53	3021	69 20 6	3022	67 50 21	3025
	SATURN	E.	95 35 3	2596	93 56 3	2587	92 16 50	2577	90 37 24	2567
	SUN	E.	126 49 16	2889	125 16 43	2879	123 43 57	2869	122 10 58	2858
10	Spica	W.	92 31 51	2509	94 12 52	2499	95 54 6	2490	97 35 33	2481
	Antares	W.	46 38 5	2517	48 18 55	2506	50 0 0	2495	51 41 21	2484
	MARS	E.	25 16 36	2726	23 40 30	2720	22 4 17	2715	20 27 57	2710
	α Pegasi	E.	60 22 56	3058	58 53 55	3070	57 25 9	3084	55 56 40	3100
	SATURN	E.	82 17 5	2522	80 36 22	2512	78 55 26	2503	77 14 17	2494
	SUN	E.	114 22 44	2808	112 48 26	2797	111 13 54	2787	109 39 9	2777
11	Spica	W.	106 6 0	2436	107 48 43	2427	109 31 39	2418	111 14 48	2410
	Antares	W.	60 11 50	2432	61 54 40	2422	63 37 44	2412	65 21 2	2401
	SATURN	E.	68 45 15	2447	67 2 46	2138	65 20 5	2428	63 37 10	2418
	SUN	E.	101 42 2	2725	100 5 56	2715	98 29 36	2705	96 53 3	2695
12	Antares	W.	74 1 7	2353	75 45 50	2344	77 30 46	2334	79 15 56	2325
	SATURN	E.	54 59 15	2372	53 15 0	2364	51 30 33	2355	49 45 53	2346
	SUN	E.	88 46 54	2645	87 9 0	2635	85 30 52	2625	83 52 31	2615
13	Antares	W.	88 5 0	2282	89 51 27	2274	91 38 5	2266	93 24 55	2258
	α Aquilæ	W.	49 7 59	3789	50 23 13	3703	51 39 57	3624	52 58 5	3552
	SATURN	E.	40 59 27	2305	39 13 34	2298	37 27 31	2290	35 41 16	2283
	SUN	E.	75 37 34	2569	73 57 57	2561	72 18 8	2552	70 38 7	2543
14	Antares	W.	102 21 49	2224	104 9 42	2218	105 57 43	2212	107 45 53	2207
	α Aquilæ	W.	59 46 42	3271	61 11 27	3229	62 37 2	3189	64 3 24	3153
	MARS	W.	28 26 3	2424	30 9 4	2415	31 52 18	2406	33 35 44	2398
	SATURN	E.	26 47 36	2254	25 0 28	2251	23 13 15	2248	21 25 58	2246
	SUN	E.	62 15 16	2506	60 34 11	2499	58 52 57	2493	57 11 34	2487
15	Antares	W.	116 48 29	2187	118 37 17	2184	120 26 8	2182	122 15 3	2180
	α Aquilæ	W.	71 24 58	3015	72 54 52	2995	74 25 11	2977	75 55 53	2962
	MARS	W.	42 15 21	2369	43 59 40	2365	45 44 6	2361	47 28 37	2358
	SUN	E.	48 42 42	2463	47 0 36	2459	45 18 25	2456	43 36 10	2453
16	α Aquilæ	W.	83 33 25	2913	85 5 27	2909	86 37 34	2907	88 9 44	2906
	MARS	W.	56 12 11	2348	57 57 0	2348	59 41 49	2349	61 26 37	2350
	SUN	E.	35 4 14	2448	33 21 48	2149	31 39 23	2150	29 57 0	2452
17	α Aquilæ	W.	95 49 56	2932	97 21 34	2943	98 52 58	2956	100 24 6	2970
	MARS	W.	70 10 2	2363	71 54 30	2367	73 38 52	2372	75 23 7	2378
	SUN	E.	21 26 6	2475	19 44 17	2482	18 2 38	2491	16 21 12	2500
21	SUN	W.	31 18 35	2854	32 51 53	2870	34 24 50	2887	35 57 25	2904
	Regulus	E.	57 1 45	2545	55 21 35	2562	53 41 48	2579	52 2 24	2596

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh	P. L. of Diff.	VIh	P. L. of Diff.	IXh	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
21	JUPITER	E.	70 19 16	2490	68 37 52	2507	66 56 50	2524	65 16 11	2541
	Spica	E.	117 47 45	2494	116 6 24	2510	114 25 24	2525	112 44 45	2540
22	SUN	W.	37 29 39	2922	39 1 30	2939	40 33 0	2956	42 4 8	2973
	Regulus	E.	50 23 24	2614	48 44 48	2632	47 6 36	2649	45 28 48	2666
	JUPITER	E.	56 58 41	2626	55 20 21	2643	53 42 24	2660	52 4 50	2677
	Spica	E.	104 26 50	2618	102 48 20	2634	101 10 12	2650	99 32 25	2666
23	SUN	W.	49 34 26	3059	51 3 26	3075	52 32 6	3091	54 0 26	3108
	Regulus	E.	37 25 46	2757	35 50 22	2776	34 15 23	2795	32 40 49	2815
	JUPITER	E.	44 2 44	2763	42 27 28	2780	40 52 34	2797	39 18 2	2814
	Spica	E.	91 28 50	2746	89 53 11	2761	88 17 52	2777	86 42 54	2792
24	SUN	W.	61 17 14	3186	62 43 40	3201	64 9 48	3215	65 35 39	3229
	JUPITER	E.	31 30 59	2901	29 58 41	2919	28 26 46	2937	26 55 14	2956
	Spica	E.	78 52 55	2866	77 19 52	2880	75 47 7	2893	74 14 39	2907
25	SUN	W.	72 40 56	3294	74 5 15	3305	75 29 20	3316	76 53 13	3327
	Pollux	W.	24 15 27	2986	25 45 57	2993	27 16 19	2999	28 46 33	3005
	Spica	E.	66 36 31	2969	65 5 40	2981	63 35 4	2992	62 4 42	3003
26	SUN	W.	83 49 40	3373	85 12 26	3381	86 35 4	3389	87 57 33	3396
	Pollux	W.	36 15 47	3036	37 45 14	3042	39 14 35	3047	40 43 49	3052
	Spica	E.	54 36 5	3052	53 6 57	3062	51 38 1	3071	50 9 16	3079
	Antares	E.	100 27 9	3031	98 57 35	3039	97 28 10	3046	95 58 54	3052
27	SUN	W.	94 48 11	3423	96 10 2	3427	97 31 48	3430	98 53 31	3432
	Pollux	W.	48 8 33	3073	49 37 16	3076	51 5 55	3078	52 34 31	3080
	Spica	E.	42 47 54	3117	41 20 5	3124	39 52 24	3131	38 24 52	3137
	Antares	E.	88 34 15	3076	87 5 36	3079	85 37 2	3082	84 8 31	3085
28	SUN	W.	105 41 31	3438	107 3 4	3438	108 24 38	3437	109 46 13	3436
	Pollux	W.	59 57 6	3083	61 25 36	3083	62 54 6	3082	64 22 38	3080
	Regulus	W.	24 7 48	3150	25 34 57	3143	27 2 15	3136	28 29 42	3129
	JUPITER	W.	17 6 13	3212	18 32 8	3198	19 58 20	3185	21 24 47	3173
	Antares	E.	76 46 36	3092	75 18 17	3091	73 49 57	3091	72 21 37	3091
29	SUN	W.	116 34 39	3422	117 56 31	3418	119 18 27	3413	120 40 29	3408
	Pollux	W.	71 45 53	3067	73 14 43	3063	74 43 38	3059	76 12 38	3054
	Regulus	W.	35 48 58	3096	37 17 12	3090	38 45 34	3083	40 14 4	3077
	JUPITER	W.	28 40 6	3130	30 7 39	3123	31 35 21	3115	33 3 12	3108
	Antares	E.	64 59 31	3080	63 30 57	3077	62 2 20	3073	60 33 38	3069
30	Pollux	W.	83 39 15	3025	85 8 57	3018	86 38 48	3011	88 8 47	3003
	Regulus	W.	47 38 41	3040	49 8 3	.033	50 37 35	3025	52 7 17	3016
	JUPITER	W.	40 24 42	3070	41 53 28	3062	43 22 24	3054	44 51 30	3046
	Antares	E.	53 8 49	3046	51 39 33	3040	50 10 10	3034	48 40 40	3028
31	Pollux	W.	95 41 10	2962	97 12 10	2953	98 43 22	2944	100 14 45	2935
	Regulus	W.	59 38 29	2972	61 9 17	2962	62 40 18	2952	64 11 31	2942
	JUPITER	W.	52 19 41	3000	53 49 53	2990	55 20 18	2981	56 50 55	2971
	Antares	E.	41 11 17	2997	39 41 1	2991	38 10 37	2985	36 40 6	2980

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XV^h	P. L. of Diff.	XVIII^h	P. L. of Diff.	XXI^h	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
21	Jupiter	E.	63 35 55	2558	61 56 2	2574	60 16 32	2591	58 37 25	2608
	Spica	E.	111 4 28	2555	109 24 31	2571	107 44 56	2586	106 5 42	2602
22	Sun	W.	43 34 55	2990	45 5 20	3008	46 35 23	3025	48 5 5	3042
	Regulus	E.	43 51 23	2684	42 14 22	2703	40 37 46	2721	39 1 34	2739
	Jupiter	E.	50 27 39	2694	48 50 51	2711	47 14 26	2729	45 38 24	2746
	Spica	E.	97 54 59	2682	96 17 55	2698	94 41 12	2714	93 4 50	2730
23	Sun	W.	55 28 26	3124	56 56 6	3140	58 23 27	3155	59 50 30	3171
	Regulus	E.	31 6 41	2835	29 32 59	2855	27 59 43	2876	26 26 53	2897
	Jupiter	E.	37 43 53	2831	36 10 6	2848	34 36 41	2866	33 3 39	2883
	Spica	E.	85 8 15	2807	83 33 56	2822	81 59 57	2837	80 26 17	2851
24	Sun	W.	67 1 14	3243	68 26 32	3256	69 51 35	3269	71 16 23	3282
	Jupiter	E.	25 24 5	2976	23 53 21	2996	22 23 3	3017	20 53 11	3038
	Spica	E.	72 42 29	2920	71 10 36	2933	69 38 58	2946	68 7 37	2958
25	Sun	W.	78 16 53	3337	79 40 21	3347	81 3 38	3356	82 26 44	3365
	Pollux	W.	30 16 40	3012	31 46 38	3018	33 16 29	3024	34 46 12	3030
	Spica	E.	60 34 33	3014	59 4 38	3024	57 34 55	3034	56 5 24	3043
26	Sun	W.	89 19 54	3402	90 42 7	3408	92 4 14	3413	93 26 15	3418
	Pollux	W.	42 12 57	3057	43 41 59	3062	45 10 55	3066	46 39 46	3069
	Spica	E.	48 40 41	3087	47 12 15	3095	45 43 59	3102	44 15 52	3110
	Antares	E.	94 29 45	3057	93 0 43	3063	91 31 48	3068	90 2 59	3072
27	Sun	W.	100 15 11	3434	101 36 48	3436	102 58 24	3438	104 19 58	3438
	Pollux	W.	54 3 5	3082	55 31 37	3083	57 0 7	3083	58 28 37	3084
	Spica	E.	36 57 29	3145	35 30 14	3153	34 3 9	3160	32 36 12	3168
	Antares	E.	82 40 4	3087	81 11 39	3089	79 43 17	3090	78 14 56	3091
28	Sun	W.	111 7 49	3434	112 29 27	3431	113 51 8	3429	115 12 52	3426
	Pollux	W.	65 51 11	3078	67 19 47	3076	68 48 25	3073	70 17 7	3070
	Regulus	W.	29 57 17	3122	31 25 0	3115	32 52 52	3109	34 20 51	3102
	Jupiter	W.	22 51 28	3163	24 18 21	3154	25 45 26	3145	27 12 41	3137
	Antares	E.	70 53 16	3090	69 24 54	3088	67 56 29	3085	66 28 1	3083
29	Sun	W.	122 2 37	3402	123 24 51	3397	124 47 11	3391	126 9 38	3384
	Pollux	W.	77 41 44	3049	79 10 56	3043	80 40 15	3037	82 9 41	3031
	Regulus	W.	41 42 42	3070	43 11 28	3063	44 40 23	3055	46 9 27	3047
	Jupiter	W.	34 31 12	3101	35 59 21	3094	37 27 38	3086	38 56 5	3078
	Antares	E.	59 4 51	3065	57 35 59	3061	56 7 2	3056	54 37 59	3051
30	Pollux	W.	89 38 56	2995	91 9 15	2988	92 39 43	2980	94 10 21	2971
	Regulus	W.	53 37 10	3008	55 7 13	2999	56 37 27	2990	58 7 52	2981
	Jupiter	W.	46 20 46	3037	47 50 13	3028	49 19 51	3019	50 49 40	3010
	Antares	E.	47 11 2	3022	45 41 17	3016	44 11 25	3010	42 41 25	3004
31	Pollux	W.	101 46 20	2925	103 18 7	2915	104 50 7	2905	106 22 19	2895
	Regulus	W.	65 42 56	2932	67 14 34	2922	68 46 25	2912	70 18 29	2901
	Jupiter	W.	58 21 44	2961	59 52 46	2950	61 24 1	2940	62 55 29	2929
	Antares	E.	35 9 28	2975	33 38 44	2970	32 7 53	2966	30 36 56	2962

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Semi-diameter.	Sidereal Time of Semi-diameter Passing Meridian.	Equation of Time, to be Subtracted from / Added to Apparent Time.	Diff. for 1 Hour.
		h m s	s	° ′ ″	″	′ ″	s	m s	s
Tues.	1	4 34 49.29	10.221	N.22 0 29.5	+20.76	15 47.98	68.37	2 28.96	0.364
Wed.	2	4 38 54.80	10.237	22 8 36.2	19.80	15 47.84	68.42	2 20.03	0.380
Thur.	3	4 43 0.70	10.253	22 16 19.7	18.83	15 47.71	68.47	2 10.71	0.396
Frid.	4	4 47 6.97	10.269	22 23 39.9	+17.85	15 47.58	68.52	2 1.03	0.411
Sat.	5	4 51 13.60	10.283	22 30 36.7	16.87	15 47.45	68.57	1 50.99	0.426
SUN.	6	4 55 20.57	10.297	22 37 9.9	15.89	15 47.32	68.61	1 40.60	0.440
Mon.	7	4 59 27.87	10.310	22 43 19.3	+14.90	15 47.21	68.65	1 29.88	0.453
Tues.	8	5 3 35.48	10.323	22 49 5.0	13.90	15 47.09	68.69	1 18.86	0.466
Wed.	9	5 7 43.39	10.335	22 54 26.8	12.90	15 46.98	68.73	1 7.54	0.478
Thur.	10	5 11 51.60	10.347	22 59 24.4	+11.89	15 46.87	68.76	0 55.93	0.489
Frid.	11	5 16 0.06	10.358	23 3 57.7	10.88	15 46.76	68.79	0 44.05	0.499
Sat.	12	5 20 8.75	10.367	23 8 6.8	9.87	15 46.66	68.82	0 31.95	0.509
SUN.	13	5 24 17.66	10.376	23 11 51.6	+ 8.85	15 46.56	68.85	0 19.64	0.517
Mon.	14	5 28 26.77	10.383	23 15 11.9	7.83	15 46.47	68.87	0 7.13	0.525
Tues.	15	5 32 36.04	10.390	23 18 7.5	6.81	15 46.38	68.89	0 5.55	0.531
Wed.	16	5 36 45.45	10.395	23 20 38.5	+ 5.78	15 46.30	68.91	0 18.38	0.536
Thur.	17	5 40 54.98	10.399	23 22 44.8	4.75	15 46.22	68.92	0 31.32	0.540
Frid.	18	5 45 4.59	10.402	23 24 26.4	3.72	15 46.15	68.93	0 44.33	0.543
Sat.	19	5 49 14.25	10.403	23 25 43.1	+ 2.69	15 46.09	68.94	0 57.39	0.545
SUN.	20	5 53 23.93	10.404	23 26 35.0	1.65	15 46.03	68.94	1 10.49	0.546
Mon.	21	5 57 33.62	10.403	23 27 2.1	+ 0.62	15 45.98	68.94	1 23.57	0.545
Tues.	22	6 1 43.28	10.401	23 27 4.3	− 0.42	15 45.93	68.94	1 36.65	0.543
Wed.	23	6 5 52.89	10.398	23 26 41.7	1.46	15 45.88	68.93	1 49.66	0.540
Thur.	24	6 10 2.41	10.395	23 25 54.3	2.49	15 45.84	68.92	2 2.59	0.537
Frid.	25	6 14 11.84	10.391	23 24 42.1	− 3.52	15 45.81	68.91	2 15.43	0.532
Sat.	26	6 18 21.15	10.385	23 23 5.1	4.56	15 45.78	68.89	2 28.14	0.526
SUN.	27	6 22 30.30	10.378	23 21 3.4	5.59	15 45.76	68.87	2 40.70	0.519
Mon.	28	6 26 39.27	10.370	23 18 37.1	− 6.61	15 45.74	68.85	2 53.08	0.512
Tues.	29	6 30 48.05	10.361	23 15 46.2	7.63	15 45.72	68.82	3 5.26	0.503
Wed.	30	6 34 56.61	10.352	23 12 30.9	8.65	15 45.70	68.79	3 17.24	0.494
Thur.	31	6 39 4.94	10.342	N.23 8 51.2	− 9.66	15 45.69	68.75	3 28.98	0.484

Note.—The mean time of semidiameter passing the meridian may be found by subtracting 0s.19 from the sidereal time. The sign + prefixed to the hourly change of declination indicates that north declinations are increasing; the sign − indicates that north declinations are decreasing.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S				Equation of Time, to be Added to / Subtracted from Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.			
		h m s	s	° ′ ″	″	m s	s	h m s
Tues.	1	4 34 49.71	10.220	N.22 0 30.4	+20.75	2 28.94	0.364	4 37 18.66
Wed.	2	4 38 55.20	10.237	22 8 37.0	19.79	2 20.01	0.380	4 41 15.21
Thur.	3	4 43 1.07	10.253	22 16 20.4	18.82	2 10.70	0.396	4 45 11.77
Frid.	4	4 47 7.31	10.268	22 23 40.5	+17.84	2 1.02	0.411	4 49 8.33
Sat.	5	4 51 13.91	10.282	22 30 37.2	16.86	1 50.98	0.426	4 53 4.89
SUN.	6	4 55 20.85	10.296	22 37 10.3	15.88	1 40.59	0.440	4 57 1.44
Mon.	7	4 59 28.12	10.309	22 43 19.7	+14.89	1 29.88	0.453	5 0 58.00
Tues.	8	5 3 35.71	10.322	22 49 5.3	13.90	1 18.85	0.466	5 4 54.56
Wed.	9	5 7 43.60	10.334	22 54 26.9	12.90	1 7.52	0.478	5 8 51.12
Thur.	10	5 11 51.76	10.346	22 59 24.5	+11.89	0 55.91	0.489	5 12 47.68
Frid.	11	5 16 0.18	10.356	23 3 57.8	10.88	0 44.05	0.499	5 16 44.23
Sat.	12	5 20 8.84	10.365	23 8 6.9	9.86	0 31.95	0.509	5 20 40.79
SUN.	13	5 24 17.72	10.373	23 11 51.6	+ 8.85	0 19.63	0.517	5 24 37.35
Mon.	14	5 28 26.79	10.381	23 15 11.8	7.83	0 7.12	0.525	5 28 33.91
Tues.	15	5 32 36.02	10.388	23 18 7.5	6.80	0 5.56	0.531	5 32 30.46
Wed.	16	5 36 45.40	10.393	23 20 38.5	+ 5.77	0 18.38	0.536	5 36 27.02
Thur.	17	5 40 54.89	10.397	23 22 44.8	4.74	0 31.31	0.540	5 40 23.58
Frid.	18	5 45 4.46	10.400	23 24 26.3	3.71	0 44.32	0.543	5 44 20.14
Sat.	19	5 49 14.08	10.402	23 25 43.1	+ 2.67	0 57.38	0.545	5 48 16.70
SUN.	20	5 53 23.73	10.402	23 26 35.0	1.64	1 10.48	0.546	5 52 13.25
Mon.	21	5 57 33.39	10.401	23 27 2.0	+ 0.61	1 23.58	0.545	5 56 9.81
Tues.	22	6 1 43.01	10.400	23 27 4.3	− 0.43	1 36.64	0.543	6 0 6.37
Wed.	23	6 5 52.58	10.397	23 26 41.7	1.46	1 49.65	0.540	6 4 2.93
Thur.	24	6 10 2.07	10.393	23 25 54.3	2.50	2 2.58	0.537	6 7 59.49
Frid.	25	6 14 11.46	10.389	23 24 42.2	− 3.53	2 15.42	0.532	6 11 56.04
Sat.	26	6 18 20.73	10.383	23 23 5.2	4.56	2 28.13	0.526	6 15 52.60
SUN.	27	6 22 29.84	10.376	23 21 3.6	5.59	2 40.68	0.519	6 19 49.16
Mon.	28	6 26 38.78	10.368	23 18 37.4	− 6.61	2 53.06	0.512	6 23 45.72
Tues.	29	6 30 47.52	10.359	23 15 46.6	7.63	3 5.24	0.503	6 27 42.28
Wed.	30	6 34 56.04	10.350	23 12 31.4	8.65	3 17.21	0.494	6 31 38.83
Thur.	31	6 39 4.34	10.340	N.23 8 51.8	− 9.66	3 28.95	0.484	6 35 35.39

Note.—The semidiameter for mean noon may be assumed the same as that for apparent noon. The sign + prefixed to the hourly change of declination indicates that north declinations are increasing; the sign − indicates that north declinations are decreasing.

Diff. for 1 Hour, $+9^{s}.8565$. (Table III.)

AT GREENWICH MEAN NOON.

Day of the Month.	Day of the Year.	THE SUN'S TRUE LONGITUDE. λ	THE SUN'S TRUE LONGITUDE. λ′	Diff. for 1 Hour.	LATITUDE.	Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.
		° ′ ″	′ ″	″	″			h m s
1	152	70 19 52.7	19 49.2	143.64	+ 0.63	0.006 1521	+ 25.9	19 19 30.87
2	153	71 17 19.5	17 15.9	143.60	0.51	0.006 2137	25.4	19 15 34.96
3	154	72 14 45.3	14 41.5	143.55	0.39	0.006 2740	24.9	19 11 39.04
4	155	73 12 10.0	12 6.1	143.51	+ 0.26	0.006 3332	+ 24.4	19 7 43.13
5	156	74 9 33.9	9 29.8	143.48	+ 0.12	0.006 3910	23.9	19 3 47.22
6	157	75 6 57.0	6 52.7	143.45	— 0.01	0.006 4477	23.3	18 59 51.31
7	158	76 4 19.4	4 14.9	143.42	— 0.11	0.006 5030	+ 22.7	18 55 55.40
8	159	77 1 41.1	1 36.5	143.39	0.20	0.006 5568	22.1	18 51 59.48
9	160	77 59 2.3	58 57.5	143.37	0.25	0.006 6092	21.4	18 48 3.57
10	161	78 56 23.0	56 18.0	143.35	— 0.28	0.006 6599	+ 20.7	18 44 7.66
11	162	79 53 43.3	53 38.1	143.33	0.28	0.006 7087	19.9	18 40 11.75
12	163	80 51 3.2	50 57.8	143.32	0.24	0.006 7556	19.1	18 36 15.84
13	164	81 48 22.6	48 17.1	143.30	— 0.17	0.006 8003	+ 18.2	18 32 19.92
14	165	82 45 41.7	45 36.0	143.29	— 0.08	0.006 8428	17.2	18 28 24.01
15	166	83 43 0.4	42 54.5	143.27	+ 0.05	0.006 8829	16.2	18 24 28.10
16	167	84 40 18.7	40 12.6	143.25	+ 0.19	0.006 9204	+ 15.1	18 20 32.19
17	168	85 37 36.5	37 30.3	143.23	0.33	0.006 9554	14.0	18 16 36.28
18	169	86 34 53.8	34 47.4	143.21	0.47	0.006 9878	13.0	18 12 40.37
19	170	87 32 10.7	32 4.1	143.19	+ 0.60	0.007 0176	+ 11.9	18 8 44.45
20	171	88 29 26.9	29 20.1	143.16	0.71	0.007 0448	10.8	18 4 48.54
21	172	89 26 42.6	26 35.6	143.14	0.81	0.007 0696	9.8	18 0 52.63
22	173	90 23 57.6	23 50.5	143.12	+ 0.86	0.007 0919	+ 8.8	17 56 56.72
23	174	91 21 12.1	21 4.8	143.10	0.90	0.007 1118	7.8	17 53 0.80
24	175	92 18 26.0	18 18.5	143.07	0.93	0.007 1295	6.9	17 49 4.89
25	176	93 15 39.4	15 31.7	143.05	+ 0.91	0.007 1451	+ 6.0	17 45 8.98
26	177	94 12 52.2	12 44.4	143.03	0.86	0.007 1586	5.2	17 41 13.07
27	178	95 10 4.6	9 56.5	143.01	0.79	0.007 1702	4.4	17 37 17.16
28	179	96 7 16.4	7 8.2	142.99	+ 0.70	0.007 1799	+ 3.7	17 33 21.24
29	180	97 4 27.9	4 19.5	142.98	0.59	0.007 1878	3.0	17 29 25.33
30	181	98 1 39.1	1 30.5	142.97	0.48	0.007 1940	2.3	17 25 29.42
31	182	98 58 49.9	58 41.2	142.95	+ 0.36	0.007 1987	+ 1.6	17 21 33.51

NOTE.—The numbers in column λ correspond to the true equinox of the date; in column λ′ to the mean equinox of January $0^d.0$.

Diff. for 1 Hour, —$9^s.8296$. (Table II.)

GREENWICH MEAN TIME.

THE MOON'S

Day of the Month.	SEMIDIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
	′ ″	′ ″	′ ″	″	′ ″	″	h m	m	d
1	15 4.4	15 8.5	55 13.1	+ 1.20	55 28.0	+ 1.28	10 17.2	1.89	12.9
2	15 12.7	15 17.2	55 43.8	1.34	56 0.2	1.38	11 4.3	2.03	13.9
3	15 21.8	15 26.4	56 17.0	1.40	56 33.8	1.40	11 54.9	2.19	14.9
4	15 30.9	15 35.4	56 50.6	+ 1.38	57 6.9	+ 1.34	12 49.2	2.33	15.9
5	15 39.7	15 43.8	57 22.7	1.29	57 37.9	1.23	13 46.2	2.41	16.9
6	15 47.7	15 51.3	57 52.2	1.15	58 5.6	1.08	14 44.5	2.43	17.9
7	15 54.7	15 57.8	58 18.0	+ 0.99	58 29.4	+ 0.91	15 42.1	2.37	18.9
8	16 0.7	16 3.2	58 39.8	0.82	58 49.1	0.73	16 37.8	2.27	19.9
9	16 5.5	16 7.4	58 57.4	0.65	59 4.7	0.56	17 31.0	2.17	20.9
10	16 9.1	16 10.5	59 10.9	+ 0.47	59 15 9	+ 0.37	18 22.0	2.09	21.9
11	16 11.5	16 12.2	59 19.7	0.27	59 22.3	+ 0.15	19 11.6	2.05	22.9
12	16 12.6	16 12.5	59 23.5	+ 0.04	59 23.3	− 0.09	20 1.0	2.06	23.9
13	16 12.0	16 11.0	59 21.4	− 0.23	59 17.8	− 0.37	20 51.1	2.12	24.9
14	16 9.5	16 7.6	59 12.4	0.53	59 5.2	0.68	21 43.0	2.21	25.9
15	16 5.1	16 2.1	58 56.0	0.85	58 44.9	1.00	22 37.1	2.30	26.9
16	15 58.5	15 54.5	58 31.9	− 1.15	58 17.2	− 1.28	23 33.2	2.37	27.9
17	15 50.1	15 45.3	58 1.0	1.40	57 43.5	1.50	ó	. . .	28.9
18	15 40.3	15 35.0	57 24.9	1.58	57 5.5	1.63	0 30.4	2.38	0.5
19	15 29.6	15 24.3	56 45.8	− 1.64	56 26.1	− 1.63	1 27.0	2.32	1.5
20	15 19.0	15 13.8	56 6.6	1.59	55 47.8	1.52	2 21.4	2.20	2.5
21	15 8.9	15 4.5	55 30.0	1.43	55 13.5	1.30	3 12.5	2.05	3.5
22	15 0.5	14 56.9	54 58.6	− 1.16	54 45.6	− 1.00	4 0.0	1.91	4.5
23	14 53.9	14 51.5	54 34.7	0.82	54 26.0	0.63	4 44.4	1.79	5.5
24	14 49.8	14 48.8	54 19.6	− 0.43	54 15.7	− 0.22	5 26.4	1.71	6.5
25	14 48.4	14 48.8	54 14.4	+ 0.00	54 15.7	+ 0.21	6 6.9	1.67	7.5
26	14 49.8	14 51.6	54 19.6	0.43	54 26.0	0.64	6 47.0	1.68	8.5
27	14 54.0	14 57.0	54 34.9	0.84	54 46.2	1.03	7 27.9	1.73	9.5
28	15 0.7	15 4.9	54 59.6	+ 1.20	55 15.0	+ 1.35	8 10.4	1.83	10.5
29	15 9.6	15 14.6	55 32.2	1.49	55 50.8	1.60	8 55.8	1.96	11.5
30	15 20.0	15 25.7	56 10.6	1.68	56 31.2	1.73	9 44.9	2.13	12.5
31	15 31.4	15 37.1	56 52.2	1.75	57 13.2	1.74	10 37.9	2.29	13.5
32	15 42.7	15 48.1	57 33.9	+ 1.69	57 53.8	+ 1.63	11 34.7	2.43	14.5

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	TUESDAY 1.			
	h m s	s	° ′ ″	″
0	14 35 57.74	1.9492	S. 11 58 58.8	11.727
1	14 37 54.82	1.9535	12 10 41.2	11.686
2	14 39 52.16	1.9579	12 22 21.1	11.643
3	14 41 49.77	1.9624	12 33 58.4	11.600
4	14 43 47.65	1.9670	12 45 33.1	11.556
5	14 45 45.81	1.9717	12 57 5.1	11.510
6	14 47 44.25	1.9763	13 8 34.3	11.462
7	14 49 42.97	1.9811	13 20 0.6	11.415
8	14 51 41.98	1.9858	13 31 24.1	11.367
9	14 53 41.27	1.9906	13 42 44.6	11.317
10	14 55 40.85	1.9955	13 54 2.1	11.266
11	14 57 40.73	2.0004	14 5 16.5	11.214
12	14 59 40.90	2.0053	14 16 27.8	11.161
13	15 1 41.37	2.0103	14 27 35.8	11.107
14	15 3 42.14	2.0154	14 38 40.6	11.052
15	15 5 43.22	2.0205	14 49 42.1	10.996
16	15 7 44.60	2.0256	15 0 40.1	10.937
17	15 9 46.29	2.0308	15 11 34.6	10.879
18	15 11 48.30	2.0361	15 22 25.6	10.820
19	15 13 50.62	2.0413	15 33 13.0	10.759
20	15 15 53.26	2.0466	15 43 56.7	10.697
21	15 17 56.21	2.0519	15 54 36.7	10.635
22	15 19 59.49	2.0573	16 5 12.9	10.571
23	15 22 3.09	2.0627	S. 16 15 45.2	10.505
	WEDNESDAY 2.			
0	15 24 7.02	2.0682	S. 16 26 13.5	10.438
1	15 26 11.28	2.0737	16 36 37.8	10.371
2	15 28 15.86	2.0792	16 46 58.0	10.302
3	15 30 20.78	2.0848	16 57 14.1	10.232
4	15 32 26.04	2.0904	17 7 25.9	10.161
5	15 34 31.63	2.0959	17 17 33.4	10.088
6	15 36 37.55	2.1016	17 27 36.5	10.015
7	15 38 43.82	2.1073	17 37 35.2	9.941
8	15 40 50.43	2.1130	17 47 29.4	9.865
9	15 42 57.38	2.1187	17 57 19.0	9.787
10	15 45 4.67	2.1244	18 7 3.9	9.709
11	15 47 12.31	2.1302	18 16 44.1	9.630
12	15 49 20.29	2.1359	18 26 19.5	9.549
13	15 51 28.62	2.1417	18 35 50.0	9.467
14	15 53 37.30	2.1476	18 45 15.5	9.383
15	15 55 46.33	2.1534	18 54 36.0	9.299
16	15 57 55.71	2.1592	19 3 51.4	9.213
17	16 0 5.44	2.1652	19 13 1.6	9.127
18	16 2 15.52	2.1710	19 22 6.6	9.039
19	16 4 25.96	2.1768	19 31 6.3	8.949
20	16 6 36.75	2.1827	19 40 0.5	8.858
21	16 8 47.89	2.1886	19 48 49.3	8.767
22	16 10 59.38	2.1945	19 57 32.5	8.673
23	16 13 11.23	2.2004	20 6 10.1	8.579
24	16 15 23.43	2.2062	S. 20 14 42.0	8.483

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	THURSDAY 3.			
	h m s	s	° ′ ″	″
0	16 15 23.43	2.2062	S. 20 14 42.0	8.483
1	16 17 35.98	2.2122	20 23 8.1	8.387
2	16 19 48.89	2.2181	20 31 28.4	8.289
3	16 22 2.15	2.2239	20 39 42.8	8.190
4	16 24 15.76	2.2298	20 47 51.2	8.089
5	16 26 29.73	2.2357	20 55 53.5	7.987
6	16 28 44.05	2.2415	21 3 49.6	7.884
7	16 30 58.72	2.2473	21 11 39.5	7.780
8	16 33 13.73	2.2532	21 19 23.2	7.674
9	16 35 29.09	2.2589	21 27 0.5	7.568
10	16 37 44.80	2.2647	21 34 31.4	7.460
11	16 40 0.86	2.2705	21 41 55.7	7.351
12	16 42 17.26	2.2762	21 49 13.5	7.241
13	16 44 34.00	2.2819	21 56 24.6	7.129
14	16 46 51.09	2.2876	22 3 29.0	7.016
15	16 49 8.52	2.2933	22 10 26.5	6.902
16	16 51 26.29	2.2989	22 17 17.2	6.787
17	16 53 44.39	2.3044	22 24 1.0	6.671
18	16 56 2.82	2.3100	22 30 37.7	6.553
19	16 58 21.59	2.3156	22 37 7.3	6.434
20	17 0 40.69	2.3210	22 43 29.8	6.314
21	17 3 0.11	2.3263	22 49 45.0	6.193
22	17 5 19.85	2.3317	22 55 52.9	6.071
23	17 7 39.92	2.3371	S. 23 1 53.5	5.947
	FRIDAY 4.			
0	17 10 0.30	2.3423	S. 23 7 46.6	5.822
1	17 12 21.00	2.3477	23 13 32.2	5.697
2	17 14 42.02	2.3528	23 19 10.3	5.571
3	17 17 3.34	2.3578	23 24 40.7	5.443
4	17 19 24.96	2.3629	23 30 3.4	5.314
5	17 21 46.89	2.3679	23 35 18.4	5.184
6	17 24 9.11	2.3728	23 40 25.5	5.052
7	17 26 31.63	2.3777	23 45 24.7	4.920
8	17 28 54.44	2.3826	23 50 15.9	4.787
9	17 31 17.54	2.3872	23 54 59.2	4.654
10	17 33 40.91	2.3918	23 59 34.4	4.518
11	17 36 4.56	2.3965	24 4 1.4	4.382
12	17 38 28.49	2.4010	24 8 20.2	4.245
13	17 40 52.68	2.4054	24 12 30.8	4.107
14	17 43 17.14	2.4097	24 16 33.0	3.967
15	17 45 41.85	2.4140	24 20 26.9	3.828
16	17 48 6.82	2.4182	24 24 12.4	3.687
17	17 50 32.04	2.4223	24 27 49.4	3.546
18	17 52 57.50	2.4263	24 31 17.9	3.403
19	17 55 23.20	2.4302	24 34 37.8	3.259
20	17 57 49.13	2.4340	24 37 49.0	3.115
21	18 0 15.28	2.4378	24 40 51.6	2.971
22	18 2 41.66	2.4415	24 43 45.5	2.824
23	18 5 8.26	2.4450	24 46 30.5	2.677
24	18 7 35.06	2.4484	S. 24 49 6.8	2.531

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	SATURDAY 5.					MONDAY 7.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	18 7 35.06	2.4484	S. 24 49 6.8	2.531	0	20 6 59.09	2.4830	S. 23 52 51.6	4.907
1	18 10 2.07	2.4517	24 51 34.2	2.382	1	20 9 28.01	2.4810	23 47 52.6	5.059
2	18 12 29.27	2.4550	24 53 52.7	2.234	2	20 11 56.81	2.4790	23 42 44.5	5.211
3	18 14 56.67	2.4582	24 56 2.3	2.084	3	20 14 25.49	2.4769	23 37 27.3	5.362
4	18 17 24.25	2.4612	24 58 2.8	1.934	4	20 16 54.04	2.4747	23 32 1.1	5.511
5	18 19 52.01	2.4642	24 59 54.4	1.784	5	20 19 22.45	2.4723	23 26 26.0	5.659
6	18 22 19.95	2.4670	25 1 36.9	1.632	6	20 21 50.72	2.4699	23 20 42.0	5.807
7	18 24 48.05	2.4697	25 3 10.3	1.481	7	20 24 18.84	2.4674	23 14 49.1	5.956
8	18 27 16.31	2.4722	25 4 34.6	1.328	8	20 26 46.81	2.4649	23 8 47.3	6.103
9	18 29 44.72	2.4747	25 5 49.7	1.175	9	20 29 14.63	2.4622	23 2 36.7	6.249
10	18 32 13.28	2.4772	25 6 55.6	1.022	10	20 31 42.28	2.4595	22 56 17.4	6.394
11	18 34 41.99	2.4795	25 7 52.3	0.868	11	20 34 9.77	2.4567	22 49 49.4	6.538
12	18 37 10.82	2.4816	25 8 39.8	0.714	12	20 36 37.09	2.4538	22 43 12.8	6.682
13	18 39 39.78	2.4837	25 9 18.0	0.559	13	20 39 4.23	2.4509	22 36 27.6	6.825
14	18 42 8.86	2.4856	25 9 46.9	0.404	14	20 41 31.20	2.4479	22 29 33.8	6.967
15	18 44 38.05	2.4874	25 10 6.5	0.248	15	20 43 57.98	2.4448	22 22 31.5	7.109
16	18 47 7.35	2.4892	25 10 16.7	−0.092	16	20 46 24.58	2.4417	22 15 20.7	7.249
17	18 49 36.75	2.4907	25 10 17.6	+0.063	17	20 48 50.99	2.4386	22 8 1.6	7.388
18	18 52 6.24	2.4922	25 10 9.1	0.220	18	20 51 17.21	2.4353	22 0 34.1	7.527
19	18 54 35.81	2.4935	25 9 51.2	0.377	19	20 53 43.23	2.4320	21 52 58.3	7.665
20	18 57 5.46	2.4947	25 9 23.9	0.534	20	20 56 9.05	2.4286	21 45 14.3	7.801
21	18 59 35.18	2.4959	25 8 47.1	0.692	21	20 58 34.66	2.4252	21 37 22.2	7.937
22	19 2 4.97	2.4969	25 8 0.9	0.848	22	21 1 0.07	2.4217	21 29 21.9	8.072
23	19 4 34.81	2.4978	S. 25 7 5.3	1.006	23	21 3 25.27	2.4182	S. 21 21 13.6	8.205
	SUNDAY 6.					TUESDAY 8.			
0	19 7 4.71	2.4987	S. 25 6 0.2	1.163	0	21 5 50.26	2.4147	S. 21 12 57.3	8.337
1	19 9 34.65	2.4993	25 4 45.7	1.321	1	21 8 15.03	2.4111	21 4 33.1	8.469
2	19 12 4.62	2.4997	25 3 21.7	1.479	2	21 10 39.59	2.4074	20 56 1.0	8.600
3	19 14 34.62	2.5002	25 1 48.2	1.637	3	21 13 3.92	2.4037	20 47 21.1	8.729
4	19 17 4.64	2.5005	25 0 5.3	1.794	4	21 15 28.03	2.4000	20 38 33.5	8.857
5	19 19 34.68	2.5007	24 58 12.9	1.952	5	21 17 51.92	2.3962	20 29 38.2	8.984
6	19 22 4.72	2.5007	24 56 11.0	2.110	6	21 20 15.58	2.3925	20 20 35.4	9.110
7	19 24 34.76	2.5007	24 53 59.7	2.267	7	21 22 39.02	2.3887	20 11 25.0	9.236
8	19 27 4.80	2.5005	24 51 38.9	2.425	8	21 25 2.23	2.3848	20 2 7.1	9.360
9	19 29 34.82	2.5002	24 49 8.7	2.582	9	21 27 25.20	2.3810	19 52 41.8	9.482
10	19 32 4.83	2.4998	24 46 29.0	2.740	10	21 29 47.95	2.3772	19 43 9.2	9.603
11	19 34 34.81	2.4993	24 43 39.9	2.897	11	21 32 10.46	2.3732	19 33 29.4	9.724
12	19 37 4.75	2.4987	24 40 41.4	3.053	12	21 34 32.73	2.3692	19 23 42.3	9.844
13	19 39 34.65	2.4980	24 37 33.5	3.210	13	21 36 54.77	2.3653	19 13 48.1	9.962
14	19 42 4.51	2.4972	24 34 16.2	3.367	14	21 39 16.57	2.3613	19 3 46.9	10.078
15	19 44 34.31	2.4962	24 30 49.5	3.522	15	21 41 38.13	2.3574	18 53 38.7	10.194
16	19 47 4.05	2.4952	24 27 13.5	3.678	16	21 43 59.45	2.3534	18 43 23.6	10.308
17	19 49 33.73	2.4940	24 23 28.1	3.833	17	21 46 20.54	2.3494	18 33 1.7	10.422
18	19 52 3.33	2.4927	24 19 33.5	3.987	18	21 48 41.39	2.3455	18 22 33.0	10.533
19	19 54 32.86	2.4914	24 15 29.6	4.142	19	21 51 2.00	2.3415	18 11 57.7	10.643
20	19 57 2.30	2.4899	24 11 16.4	4.297	20	21 53 22.37	2.3375	18 1 15.8	10.753
21	19 59 31.65	2.4883	24 6 54.0	4.451	21	21 55 42.50	2.3335	17 50 27.3	10.862
22	20 2 0.90	2.4867	24 2 22.3	4.604	22	21 58 2.39	2.3295	17 39 32.4	10.968
23	20 4 30.05	2.4849	23 57 41.5	4.756	23	22 0 22.04	2.3256	17 28 31.1	11.074
24	20 6 59.09	2.4830	S. 23 52 51.6	4.907	24	22 2 41.46	2.3217	S. 17 17 23.5	11.178

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

WEDNESDAY 9.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	22 2 41.46	2.3217	S. 17 17 23.5	11.178
1	22 5 0.64	2.3177	17 6 9.7	11.281
2	22 7 19.58	2.3137	16 54 49.8	11.382
3	22 9 38.28	2.3097	16 43 23.8	11.483
4	22 11 56.75	2.3058	16 31 51.8	11.582
5	22 14 14.98	2.3019	16 20 13.9	11.680
6	22 16 32.98	2.2981	16 8 30.2	11.777
7	22 18 50.75	2.2942	15 56 40.7	11.872
8	22 21 8.29	2.2903	15 44 45.5	11.966
9	22 23 25.59	2.2865	15 32 44.8	12.058
10	22 25 42.67	2.2827	15 20 38.6	12.149
11	22 27 59.52	2.2790	15 8 26.9	12.240
12	22 30 16.15	2.2752	14 56 9.8	12.328
13	22 32 32.55	2.2716	14 43 47.5	12.415
14	22 34 48.74	2.2679	14 31 20.0	12.501
15	22 37 4.70	2.2642	14 18 47.4	12.585
16	22 39 20.45	2.2607	14 6 9.8	12.668
17	22 41 35.99	2.2572	13 53 27.2	12.751
18	22 43 51.31	2.2536	13 40 39.7	12.831
19	22 46 6.42	2.2501	13 27 47.5	12.909
20	22 48 21.32	2.2467	13 14 50.6	12.987
21	22 50 36.02	2.2433	13 1 49.1	13.063
22	22 52 50.52	2.2399	12 48 43.0	13.139
23	22 55 4.82	2.2366	S. 12 35 32.4	13.212

THURSDAY 10.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	22 57 18.92	2.2333	S. 12 22 17.5	13.284
1	22 59 3 .82	2.2302	12 8 58.3	13.355
2	23 1 46.53	2.2270	11 55 34.9	13.424
3	23 4 0.05	2.2238	11 42 7.4	13.492
4	23 6 13.39	2.2207	11 28 35.8	13.560
5	23 8 26.54	2.2177	11 15 0.2	13.625
6	23 10 39.51	2.2147	11 1 20.8	13.688
7	23 12 52.31	2.2119	10 47 37.6	13.751
8	23 15 4.94	2.2090	10 33 50.7	13.812
9	23 17 17.40	2.2062	10 20 0.1	13.872
10	23 19 29.69	2.2035	10 6 6.0	13.931
11	23 21 41.81	2.2007	9 52 8.4	13.988
12	23 23 53.77	2.1981	9 38 7.4	14.044
13	23 26 5.58	2.1956	9 24 3.1	14.098
14	23 28 17.24	2.1931	9 9 55.6	14.151
15	23 30 28.75	2.1906	8 55 45.0	14.202
16	23 32 40.11	2.1882	8 41 31.3	14.253
17	23 34 51.34	2.1859	8 27 14.6	14.302
18	23 37 2.42	2.1836	8 12 55.1	14.349
19	23 39 13.37	2.1814	7 58 32.7	14.396
20	23 41 24.19	2.1793	7 44 7.6	14.440
21	23 43 34.89	2.1772	7 29 39.9	14.483
22	23 45 45.46	2.1752	7 15 9.6	14.526
23	23 47 55.92	2.1733	7 0 36.8	14.567
24	23 50 6.26	2.1714	S. 6 46 1.6	14.606

FRIDAY 11.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	23 50 6.26	2.1714	S. 6 46 1.6	14.606
1	23 52 16.49	2.1697	6 31 24.1	14.643
2	23 54 26.62	2.1679	6 16 44.4	14.679
3	23 56 36.64	2.1662	6 2 2.6	14.714
4	23 58 46.57	2.1647	5 47 18.7	14.747
5	0 0 56.40	2.1631	5 32 32.9	14.780
6	0 3 6.14	2.1617	5 17 45.1	14.812
7	0 5 15.80	2.1602	5 2 55.5	14.841
8	0 7 25.37	2.1589	4 48 4.2	14.868
9	0 9 34.87	2.1577	4 33 11.3	14.896
10	0 11 44.30	2.1566	4 18 16.7	14.922
11	0 13 53.66	2.1554	4 3 20.7	14.945
12	0 16 2.95	2.1544	3 48 23.3	14.967
13	0 18 12.19	2.1535	3 33 24.6	14.989
14	0 20 21.37	2.1526	3 18 24.6	15.009
15	0 22 30.50	2.1517	3 3 23.5	15.027
16	0 24 39.58	2.1510	2 48 21.4	15.044
17	0 26 48.62	2.1503	2 33 18.3	15.060
18	0 28 57.62	2.1497	2 18 14.2	15.074
19	0 31 6.59	2.1492	2 3 9.3	15.087
20	0 33 15.53	2.1487	1 48 3.7	15.098
21	0 35 24.44	2.1483	1 32 57.5	15.108
22	0 37 33.33	2.1481	1 17 50.7	15.117
23	0 39 42.21	2.1479	S. 1 2 43.5	15.124

SATURDAY 12.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	0 41 51.08	2.1477	S. 0 47 35.8	15.131
1	0 43 59.94	2.1476	0 32 27.8	15.135
2	0 46 8.79	2.1476	0 17 19.6	15.137
3	0 48 17.65	2.1477	S. 0 2 11.3	15.139
4	0 50 26.51	2.1477	N. 0 12 57.1	15.139
5	0 52 35.38	2.1480	0 28 5.4	15.138
6	0 54 44.27	2.1483	0 43 13.7	15.136
7	0 56 53.18	2.1487	0 58 21.7	15.132
8	0 59 2.11	2.1491	1 13 29.5	15.127
9	1 1 11.07	2.1496	1 28 36.9	15.120
10	1 3 20.06	2.1501	1 43 43.9	15.112
11	1 5 29.08	2.1507	1 58 50.3	15.102
12	1 7 38.15	2.1515	2 13 56.1	15.091
13	1 9 47.26	2.1523	2 29 1.2	15.078
14	1 11 56.42	2.1532	2 44 5.5	15.064
15	1 14 5.64	2.1541	2 59 8.9	15.049
16	1 16 14.91	2.1551	3 14 11.4	15.033
17	1 18 24.25	2.1562	3 29 12.9	15.015
18	1 20 33.65	2.1573	3 44 13.2	14.995
19	1 22 43.12	2.1585	3 59 12.3	14.973
20	1 24 52.67	2.1597	4 14 10.0	14.951
21	1 27 2.29	2.1611	4 29 6.4	14.928
22	1 29 12.00	2.1626	4 44 1.4	14.903
23	1 31 21.80	2.1640	4 58 54.8	14.876
24	1 33 31.68	2.1655	N. 5 13 46.5	14.847

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	SUNDAY 13.					TUESDAY 15.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	1 33 31.68	2.1655	N. 5 13 46.5	14.847	0	3 20 19.76	2.3013	N.16 6 44.1	11.807
1	1 35 41.66	2.1672	5 28 36.5	14.818	1	3 22 37.95	2.3049	16 18 29.6	11.709
2	1 37 51.74	2.1688	5 43 24.7	14.787	2	3 24 56.35	2.3085	16 30 9.2	11.610
3	1 40 1.92	2.1705	5 58 11.1	14.755	3	3 27 14.97	2.3121	16 41 42.8	11.509
4	1 42 12.20	2.1723	6 12 55.3	14.721	4	3 29 33.81	2.3157	16 53 10.3	11.407
5	1 44 22.60	2.1742	6 27 37.5	14.685	5	3 31 52.86	2.3194	17 4 31.7	11.304
6	1 46 33.11	2.1762	6 42 17.5	14.648	6	3 34 12.13	2.3230	17 15 46.8	11.199
7	1 48 43.74	2.1782	6 56 55.3	14.611	7	3 36 31.62	2.3267	17 26 55.6	11.092
8	1 50 54.49	2.1802	7 11 30.8	14.572	8	3 38 51.33	2.3303	17 37 58.0	10.985
9	1 53 5.36	2.1823	7 26 3.9	14.530	9	3 41 11.26	2.3340	17 48 53.9	10.877
10	1 55 16.36	2.1845	7 40 34.4	14.487	10	3 43 31.41	2.3376	17 59 43.2	10.768
11	1 57 27.50	2.1867	7 55 2.4	14.444	11	3 45 51.77	2.3411	18 10 25.9	10.657
12	1 59 38.77	2.1890	8 9 27.7	14.398	12	3 48 12.34	2.3447	18 21 2.0	10.544
13	2 1 50.18	2.1914	8 23 50.2	14.352	13	3 50 33.13	2.3482	18 31 31.3	10.431
14	2 4 1.74	2.1938	8 38 9.9	14.303	14	3 52 54.13	2.3517	18 41 53.7	10.315
15	2 6 13.44	2.1962	8 52 26.6	14.253	15	3 55 15.34	2.3553	18 52 9.1	10.199
16	2 8 25.29	2.1987	9 6 40.3	14.202	16	3 57 36.77	2.3588	19 2 17.6	10.082
17	2 10 37.29	2.2013	9 20 50.9	14.150	17	3 59 58.40	2.3622	19 12 19.0	9.963
18	2 12 49.45	2.2039	9 34 58.3	14.096	18.	4 2 20.24	2.3657	19 22 13.2	9.844
19	2 15 1.76	2.2066	9 49 2.4	14.040	19	4 4 42.28	2.3691	19 32 0.3	9.723
20	2 17 14.24	2.2094	10 3 3.1	13.983	20	4 7 4.53	2.3725	19 41 40.0	9.601
21	2 19 26.89	2.2122	10 17 0.4	13.925	21	4 9 26.98	2.3758	19 51 12.4	9.478
22	2 21 39.70	2.2149	10 30 54.1	13.865	22	4 11 49.63	2.3792	20 0 37.4	9.354
23	2 23 52.68	2.2178	N.10 44 44.2	13.804	23	4 14 12.48	2.3825	N.20 9 54.9	9.229
	MONDAY 14.					WEDNESDAY 16.			
0	2 26 5.84	2.2207	N.10 58 30.6	13.742	0	4 16 35.53	2.3857	N.20 19 4.9	9.102
1	2 28 19.17	2.2237	11 12 13.2	13.677	1	4 18 58.77	2.3889	20 28 7.2	8.975
2	2 30 32.69	2.2268	11 25 51.9	13.612	2	4 21 22.20	2.3921	20 37 1.9	8.847
3	2 32 46.39	2.2298	11 39 26.6	13.544	3	4 23 45.82	2.3952	20 45 48.8	8.717
4	2 35 0.27	2.2328	11 52 57.2	13.476	4	4 26 9.62	2.3982	20 54 27.9	8.587
5	2 37 14.33	2.2360	12 6 23.7	13.406	5	4 28 33.61	2.4012	21 2 59.2	8.455
6	2 39 28.59	2.2392	12 19 46.0	13.335	6	4 30 57.77	2.4042	21 11 22.5	8.322
7	2 41 43.04	2.2424	12 33 3.9	13.262	7	4 33 22.11	2.4071	21 19 37.8	8.188
8	2 43 57.68	2.2457	12 46 17.4	13.187	8	4 35 46.62	2.4099	21 27 45.1	8.054
9	2 46 12.52	2.2490	12 59 26.4	13.112	9	4 38 11.30	2.4127	21 35 44.3	7.919
10	2 48 27.56	2.2522	13 12 30.8	13.035	10	4 40 36.15	2.4155	21 43 35.4	7.783
11	2 50 42.79	2.2556	13 25 30.6	12.957	11	4 43 1.16	2.4181	21 51 18.3	7.646
12	2 52 58.23	2.2590	13 38 25.6	12.877	12	4 45 26.32	2.4207	21 58 52.9	7.507
13	2 55 13.87	2.2624	13 51 15.8	12.795	13	4 47 51.64	2.4232	22 6 19.2	7.368
14	2 57 29.72	2.2658	14 4 1.1	12.712	14	4 50 17.11	2.4257	22 13 37.1	7.228
15	2 59 45.77	2.2692	14 16 41.3	12.628	15	4 52 42.72	2.4280	22 20 46.6	7.088
16	3 2 2.03	2.2727	14 29 16.4	12.542	16	4 55 8.47	2.4303	22 27 47.7	6.947
17	3 4 18.50	2.2762	14 41 46.3	12.455	17	4 57 34.36	2.4326	22 34 40.2	6.804
18	3 6 35.18	2.2798	14 54 11.0	12.367	18	5 0 0.38	2.4347	22 41 24.2	6.662
19	3 8 52.08	2.2834	15 6 30.4	12.277	19	5 2 26.53	2.4368	22 47 59.7	6.519
20	3 11 9.19	2.2869	15 18 44.3	12.186	20	5 4 52.80	2.4387	22 54 26.5	6.374
21	3 13 26.51	2.2904	15 30 52.7	12.093	21	5 7 19.18	2.4407	23 0 44.6	6.229
22	3 15 44.04	2.2940	15 42 55.5	12.000	22	5 9 45.68	2.4425	23 6 54.0	6.084
23	3 18 1.79	2.2977	15 54 52.7	11.905	23	5 12 12.28	2.4442	23 12 54.7	5.938
24	3 20 19.76	2.3013	N.16 6 44.1	11.807	24	5 14 38.99	2.4459	N.23 18 46.6	5.792

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	THURSDAY 17.					SATURDAY 19.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	5 14 38.99	2.4459	N.23 18 46.6	5.792	0	7 12 1.86	2.4040	N.25 2 53.0	1.426
1	5 17 5.79	2.4475	23 24 29.7	5.644	1	7 14 26.00	2.4006	25 1 23.1	1.569
2	5 19 32.69	2.4490	23 30 3.9	5.496	2	7 16 49.93	2.3971	24 59 44.6	1.712
3	5 21 59.67	2.4503	23 35 29.2	5.347	3	7 19 13.65	2.3935	24 57 57.6	1.853
4	5 24 26.73	2.4517	23 40 45.6	5.198	4	7 21 37.15	2.3898	24 56 2.2	1.995
5	5 26 53.87	2.4528	23 45 53.0	5.049	5	7 24 0.43	2.3861	24 53 58.3	2.136
6	5 29 21.07	2.4538	23 50 51.5	4.900	6	7 26 23.48	2.3822	24 51 46.0	2.275
7	5 31 48.33	2.4548	23 55 41.0	4.750	7	7 28 46.29	2.3782	24 49 25.3	2.414
8	5 34 15.65	2.4558	24 0 21.5	4.599	8	7 31 8.87	2.3742	24 46 56.3	2.553
9	5 36 43.03	2.4567	24 4 52.9	4.448	9	7 33 31.20	2.3702	24 44 19.0	2.691
10	5 39 10.45	2.4573	24 9 15.3	4.297	10	7 35 53.29	2.3660	24 41 33.4	2.827
11	5 41 37.91	2.4578	24 13 28.6	4.146	11	7 38 15.12	2.3617	24 38 39.7	2.962
12	5 44 5.40	2.4584	24 17 32.8	3.994	12	7 40 36.69	2.3573	24 35 37.9	3.097
13	5 46 32.91	2.4588	24 21 27.9	3.842	13	7 42 58.00	2.3529	24 32 28.0	3.232
14	5 49 0.44	2.4590	24 25 13.9	3.690	14	7 45 19.04	2.3484	24 29 10.1	3.365
15	5 51 27.99	2.4592	24 28 50.7	3.537	15	7 47 39.81	2.3439	24 25 44.2	3.497
16	5 53 55.54	2.4592	24 32 18.4	3.385	16	7 50 0.31	2.3393	24 22 10.4	3.629
17	5 56 23.10	2.4592	24 35 36.9	3.232	17	7 52 20.53	2.3347	24 18 28.7	3.759
18	5 58 50.65	2.4590	24 38 46.2	3.079	18	7 54 40.47	2.3299	24 14 39.3	3.888
19	6 1 18.18	2.4587	24 41 46.4	2.927	19	7 57 0.12	2.3252	24 10 42.1	4.017
20	6 3 45.70	2.4584	24 44 37.4	2.773	20	7 59 19.49	2.3203	24 6 37.2	4.145
21	6 6 13.19	2.4579	24 47 19.2	2.620	21	8 1 38.56	2.3153	24 2 24.7	4.272
22	6 8 40.65	2.4573	24 49 51.8	2.467	22	8 3 57.33	2.3104	23 58 4.6	4.397
23	6 11 8.07	2.4567	N.24 52 15.3	2.315	23	8 6 15.81	2.3054	N.23 53 37.0	4.522
	FRIDAY 18.					SUNDAY 20.			
0	6 13 35.45	2.4558	N.24 54 29.6	2.162	0	8 8 33.98	2.3003	N.23 49 1.9	4.646
1	6 16 2.77	2.4549	24 56 34.7	2.009	1	8 10 51.85	2.2952	23 44 19.5	4.768
2	6 18 30.04	2.4539	24 58 30.7	1.857	2	8 13 9.41	2.2900	23 39 29.7	4.891
3	6 20 57.24	2.4527	25 0 17.5	1.703	3	8 15 26.65	2.2847	23 34 32.6	5.012
4	6 23 24.37	2.4515	25 1 55.1	1.551	4	8 17 43.58	2.2796	23 29 28.3	5.131
5	6 25 51.42	2.4501	25 3 23.6	1.399	5	8 20 0.20	2.2743	23 24 16.9	5.249
6	6 28 18.38	2.4486	25 4 43.0	1.247	6	8 22 16.50	2.2690	23 18 58.4	5.367
7	6 30 45.25	2.4471	25 5 53.2	1.094	7	8 24 32.48	2.2637	23 13 32.8	5.484
8	6 33 12.03	2.4454	25 6 54.3	0.943	8	8 26 48.14	2.2582	23 8 0.3	5.599
9	6 35 38.70	2.4436	25 7 46.4	0.792	9	8 29 3.47	2.2527	23 2 20.9	5.714
10	6 38 5.26	2.4417	25 8 29.4	0.642	10	8 31 18.47	2.2473	22 56 34.6	5.827
11	6 40 31.70	2.4397	25 9 3.4	0.491	11	8 33 33.15	2.2419	22 50 41.5	5.940
12	6 42 58.02	2.4376	25 9 28.3	0.340	12	8 35 47.50	2.2364	22 44 41.8	6.052
13	6 45 24.21	2.4353	25 9 44.2	0.190	13	8 38 1.52	2.2308	22 38 35.4	6.162
14	6 47 50.26	2.4329	25 9 51.1	+0.041	14	8 40 15.20	2.2252	22 32 22.4	6.271
15	6 50 16.16	2.4305	25 9 49.1	−0.107	15	8 42 28.55	2.2197	22 26 2.9	6.379
16	6 52 41.92	2.4280	25 9 38.2	0.256	16	8 44 41.57	2.2142	22 19 36.9	6.487
17	6 55 7.52	2.4253	25 9 18.4	0.404	17	8 46 54.25	2.2086	22 13 4.5	6.592
18	6 57 32.96	2.4226	25 8 49.7	0.552	18	8 49 6.60	2.2030	22 6 25.8	6.697
19	6 59 58.23	2.4197	25 8 12.1	0.699	19	8 51 18.61	2.1973	21 59 40.9	6.800
20	7 2 23.33	2.4168	25 7 25.8	0.845	20	8 53 30.28	2.1917	21 52 49.8	6.903
21	7 4 48.25	2.4137	25 6 30.7	0.992	21	8 55 41.61	2.1860	21 45 52.5	7.005
22	7 7 12.98	2.4106	25 5 26.8	1.137	22	8 57 52.60	2.1804	21 38 49.2	7.106
23	7 9 37.52	2.4073	25 4 14.2	1.282	23	9 0 3.26	2.1747	21 31 39.8	7.206
24	7 12 1.86	2.4040	N.25 2 53.0	1.426	24	9 2 13.57	2.1690	N.21 24 24.5	7.303

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	MONDAY 21.			
	h m s	s	° ′ ″	″
0	9 2 13.57	2.1690	N.21 24 24.5	7.303
1	9 4 23.54	2.1634	21 17 3.4	7.401
2	9 6 33.18	2.1577	21 9 36.4	7.497
3	9 8 42.47	2.1521	21 2 3.7	7.592
4	9 10 51.43	2.1465	20 54 25.3	7.687
5	9 13 0.05	2.1408	20 46 41.3	7.779
6	9 15 8.33	2.1352	20 38 51.8	7.871
7	9 17 16.27	2.1296	20 30 56.8	7.962
8	9 19 23.88	2.1240	20 22 56.4	8.052
9	9 21 31.15	2.1183	20 14 50.6	8.141
10	9 23 38.08	2.1127	20 6 39.5	8.228
11	9 25 44.68	2.1072	19 58 23.2	8.315
12	9 27 50.95	2.1017	19 50 1.7	8.401
13	9 29 56.88	2.0962	19 41 35.1	8.485
14	9 32 2.49	2.0907	19 33 3.5	8.568
15	9 34 7.76	2.0851	19 24 26.9	8.651
16	9 36 12.70	2.0797	19 15 45.4	8.732
17	9 38 17.32	2.0742	19 6 59.1	8.812
18	9 40 21.61	2.0688	18 58 8.0	8.892
19	9 42 25.58	2.0635	18 49 12.1	8.971
20	9 44 29.23	2.0581	18 40 11.5	9.047
21	9 46 32.55	2.0527	18 31 6.4	9.123
22	9 48 35.56	2.0475	18 21 56.7	9.198
23	9 50 38.25	2.0422	N.18 12 42.6	9.273
	TUESDAY 22.			
0	9 52 40.62	2.0369	N.18 3 24.0	9.347
1	9 54 42.68	2.0317	17 54 1.0	9.418
2	9 56 44.43	2.0266	17 44 33.8	9.489
3	9 58 45.87	2.0215	17 35 2.3	9.560
4	10 0 47.01	2.0164	17 25 26.6	9.629
5	10 2 47.84	2.0113	17 15 46.8	9.697
6	10 4 48.37	2.0063	17 6 2.9	9.765
7	10 6 48.60	2.0014	16 56 15.0	9.831
8	10 8 48.54	1.9965	16 46 23.2	9.897
9	10 10 48.18	1.9916	16 36 27.4	9.962
10	10 12 47.53	1.9867	16 26 27.8	10.025
11	10 14 46.59	1.9819	16 16 24.4	10.087
12	10 16 45.36	1.9772	16 6 17.3	10.149
13	10 18 43.85	1.9725	15 56 6.5	10.210
14	10 20 42.06	1.9678	15 45 52.1	10.270
15	10 22 39.99	1.9632	15 35 34.1	10.330
16	10 24 37.65	1.9587	15 25 12.5	10.388
17	10 26 35.03	1.9542	15 14 47.5	10.445
18	10 28 32.15	1.9497	15 4 19.1	10.501
19	10 30 29.00	1.9453	14 53 47.4	10.557
20	10 32 25.59	1.9410	14 43 12.3	10.612
21	10 34 21.92	1.9367	14 32 34.0	10.665
22	10 36 17.99	1.9324	14 21 52.5	10.717
23	10 38 13.81	1.9282	14 11 7.9	10.770
24	10 40 9.37	1.9240	N.14 0 20.1	10.822

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	WEDNESDAY 23.			
	h m s	s	° ′ ″	″
0	10 40 9.37	1.9240	N.14 0 20.1	10.822
1	10 42 4.69	1.9199	13 49 29.3	10.872
2	10 43 59.76	1.9159	13 38 35.5	10.921
3	10 45 54.60	1.9120	13 27 38.8	10.970
4	10 47 49.20	1.9080	13 16 39.1	11.018
5	10 49 43.56	1.9042	13 5 36.6	11.065
6	10 51 37.70	1.9004	12 54 31.3	11.111
7	10 53 31.61	1.8966	12 43 23.3	11.156
8	10 55 25.29	1.8928	12 32 12.6	11.201
9	10 57 18.75	1.8892	12 20 59.2	11.245
10	10 59 12.00	1.8857	12 9 43.2	11.288
11	11 1 5.04	1.8822	11 58 24.6	11.331
12	11 2 57.87	1.8787	11 47 3.5	11.372
13	11 4 50.49	1.8753	11 35 39.9	11.413
14	11 6 42.91	1.8721	11 24 13.9	11.452
15	11 8 35.14	1.8688	11 12 45.6	11.492
16	11 10 27.17	1.8656	11 1 14.9	11.531
17	11 12 19.01	1.8625	10 49 41.9	11.569
18	11 14 10.67	1.8594	10 38 6.6	11.607
19	11 16 2.14	1.8563	10 26 29.1	11.642
20	11 17 53.43	1.8533	10 14 49.5	11.677
21	11 19 44.54	1.8505	10 3 7.8	11.712
22	11 21 35.49	1.8477	9 51 24.0	11.747
23	11 23 26.27	1.8449	N. 9 39 38.1	11.782
	THURSDAY 24.			
0	11 25 16.88	1.8422	N. 9 27 50.2	11.814
1	11 27 7.33	1.8396	9 16 0.4	11.846
2	11 28 57.63	1.8370	9 4 8.7	11.877
3	11 30 47.77	1.8345	8 52 15.1	11.908
4	11 32 37.77	1.8321	8 40 19.7	11.938
5	11 34 27.62	1.8297	8 28 22.5	11.968
6	11 36 17.33	1.8274	8 16 23.5	11.997
7	11 38 6.91	1.8252	8 4 22.8	12.025
8	11 39 56.35	1.8229	7 52 20.5	12.052
9	11 41 45.66	1.8208	7 40 16.6	12.079
10	11 43 34.85	1.8187	7 28 11.1	12.105
11	11 45 23.91	1.8167	7 16 4.0	12.130
12	11 47 12.86	1.8149	7 3 55.4	12.155
13	11 49 1.70	1.8131	6 51 45.4	12.179
14	11 50 50.43	1.8113	6 39 33.9	12.202
15	11 52 39.06	1.8096	6 27 21.1	12.225
16	11 54 27.58	1.8079	6 15 6.9	12.248
17	11 56 16.01	1.8064	6 2 51.3	12.270
18	11 58 4.35	1.8049	5 50 34.5	12.290
19	11 59 52.60	1.8034	5 38 16.5	12.310
20	12 1 40.76	1.8020	5 25 57.3	12.330
21	12 3 28.84	1.8007	5 13 36.9	12.349
22	12 5 16.85	1.7995	5 1 15.4	12.367
23	12 7 4.78	1.7983	4 48 52.8	12.385
24	12 8 52.65	1.7972	N. 4 36 29.2	12.402

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute
	FRIDAY 25.					SUNDAY 27.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	12 8 52.65	1.7972	N 4 36 29.2	12.402	0	13 35 12.30	1.8267	S. 5 26 50.9	12.495
1	12 10 40.45	1.7962	4 24 4.6	12.418	1	13 37 1.97	1.8290	5 39 20.2	12.481
2	12 12 28.20	1.7953	4 11 39.0	12.435	2	13 38 51.78	1.8314	5 51 48.6	12.467
3	12 14 15.89	1.7943	3 59 12.4	12.450	3	13 40 41.74	1.8339	6 4 16.2	12.452
4	12 16 3.52	1.7935	3 46 45.0	12.464	4	13 42 31.85	1.8364	6 16 42.8	12.435
5	12 17 51.11	1.7928	3 34 16.7	12.479	5	13 44 22.11	1.8390	6 29 8.4	12.418
6	12 19 38.66	1.7922	3 21 47.5	12.492	6	13 46 12.53	1.8417	6 41 33.0	12.401
7	12 21 26.17	1.7915	3 9 17.6	12.505	7	13 48 3.12	1.8445	6 53 56.5	12.382
8	12 23 13.64	1.7910	2 56 46.9	12.517	8	13 49 53.87	1.8473	7 6 18.9	12.363
9	12 25 1.09	1.7906	2 44 15.5	12.528	9	13 51 44.79	1.8502	7 18 40.2	12.344
10	12 26 48.51	1.7901	2 31 43.5	12.539	10	13 53 35.89	1.8532	7 31 0.2	12.323
11	12 28 35.90	1.7897	2 19 10.8	12.550	11	13 55 27.18	1.8562	7 43 18.9	12.301
12	12 30 23.28	1.7895	2 6 37.5	12.560	12	13 57 18.64	1.8592	7 55 36.3	12.279
13	12 32 10.64	1.7893	1 54 3.6	12.569	13	13 59 10.29	1.8625	8 7 52.4	12.257
14	12 33 58.00	1.7892	1 41 29.2	12.577	14	14 1 2.14	1.8657	8 20 7.1	12.233
15	12 35 45.35	1.7891	1 28 54.3	12.585	15	14 2 54.18	1.8690	8 32 20.4	12.208
16	12 37 32.69	1.7891	1 16 19.0	12.592	16	14 4 46.42	1.8723	8 44 32.2	12.184
17	12 39 20.04	1.7892	1 3 43.2	12.599	17	14 6 38.86	1.8758	8 56 42.4	12.158
18	12 41 7.39	1.7893	0 51 7.1	12.605	18	14 8 31.52	1.8794	9 8 51.0	12.130
19	12 42 54.76	1.7896	0 38 30.6	12.612	19	14 10 24.39	1.8829	9 20 58.0	12.103
20	12 44 42.14	1.7898	0 25 53.7	12.617	20	14 12 17.47	1.8865	9 33 3.4	12.075
21	12 46 29.54	1.7902	0 13 16.6	12.620	21	14 14 10.77	1.8902	9 45 7.0	12.045
22	12 48 16.97	1.7907	N. 0 0 39.3	12.623	22	14 16 4.30	1.8941	9 57 8.8	12.014
23	12 50 4.42	1.7912	S. 0 11 58.2	12.627	23	14 17 58.06	1.8979	S. 10 9 8.8	11.983
	SATURDAY 26.					MONDAY 28.			
0	12 51 51.91	1.7917	S. 0 24 35.9	12.629	0	14 19 52.05	1.9018	S. 10 21 6.9	11.952
1	12 53 39.43	1.7924	0 37 13.7	12.631	1	14 21 46.28	1.9057	10 33 3.0	11.919
2	12 55 27.00	1.7932	0 49 51.6	12.632	2	14 23 40.74	1.9097	10 44 57.1	11.886
3	12 57 14.61	1.7939	1 2 29.6	12.633	3	14 25 35.45	1.9139	10 56 49.2	11.851
4	12 59 2.27	1.7947	1 15 7.6	12.632	4	14 27 30.41	1.9181	11 8 39.2	11.815
5	13 0 49.98	1.7957	1 27 45.5	12.632	5	14 29 25.62	1.9223	11 20 27.0	11.779
6	13 2 37.75	1.7967	1 40 23.4	12.631	6	14 31 21.09	1.9267	11 32 12.7	11.742
7	13 4 25.58	1.7977	1 53 1.2	12.629	7	14 33 16.82	1.9310	11 43 56.1	11.703
8	13 6 13.48	1.7989	2 5 38.9	12.627	8	14 35 12.81	1.9354	11 55 37.1	11.664
9	13 8 1.45	1.8001	2 18 16.4	12.623	9	14 37 9.07	1.9399	12 7 15.8	11.625
10	13 9 49.49	1.8013	2 30 53.7	12.619	10	14 39 5.60	1.9444	12 18 52.1	11.584
11	13 11 37.61	1.8027	2 43 30.7	12.614	11	14 41 2.40	1.9491	12 30 25.9	11.542
12	13 13 25.82	1.8042	2 56 7.4	12.609	12	14 42 59.49	1.9538	12 41 57.1	11.498
13	13 15 14.11	1.8057	3 8 43.8	12.603	13	14 44 56.86	1.9585	12 53 25.7	11.455
14	13 17 2.50	1.8072	3 21 19.8	12.597	14	14 46 54.51	1.9632	13 4 51.7	11.411
15	13 18 50.98	1.8088	3 33 55.4	12.590	15	14 48 52.45	1.9681	13 16 15.0	11.365
16	13 20 39.56	1.8105	3 46 30.6	12.582	16	14 50 50.68	1.9730	13 27 35.5	11.317
17	13 22 28.24	1.8123	3 59 5.3	12.573	17	14 52 49.21	1.9780	13 38 53.1	11.269
18	13 24 17.04	1.8142	4 11 39.4	12.564	18	14 54 48.04	1.9831	13 50 7.8	11.221
19	13 26 5.94	1.8160	4 24 13.0	12.555	19	14 56 47.18	1.9882	14 1 19.6	11.172
20	13 27 54.96	1.8180	4 36 46.0	12.544	20	14 58 46.62	1.9932	14 12 28.4	11.121
21	13 29 44.10	1.8201	4 49 18.3	12.532	21	15 0 46.37	1.9984	14 23 34.1	11.068
22	13 31 33.37	1.8222	5 1 49.9	12.521	22	15 2 46.43	2.0037	14 34 36.6	11.015
23	13 33 22.77	1.8244	5 14 20.8	12.508	23	15 4 46.81	2.0090	14 45 35.9	10.962
24	13 35 12.30	1.8267	S. 5 26 50.9	12.495	24	15 6 47.51	2.0143	S. 14 56 32.0	10.907

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	TUESDAY 29.			
	h m s	s	° ′ ″	″
0	15 6 47.51	2.0143	S. 14 56 32.0	10.907
1	15 8 48.53	2.0197	15 7 24.7	10.850
2	15 10 49.88	2.0252	15 18 14.0	10.793
3	15 12 51.55	2.0307	15 28 59.9	10.735
4	15 14 53.56	2.0363	15 39 42.2	10.675
5	15 16 55.91	2.0419	15 50 20.9	10.615
6	15 18 58.59	2.0475	16 0 56.0	10.553
7	15 21 1.61	2.0532	16 11 27.3	10.490
8	15 23 4.98	2.0591	16 21 54.8	10.427
9	15 25 8.70	2.0648	16 32 18.5	10.362
10	15 27 12.76	2.0706	16 42 38.2	10.295
11	15 29 17.17	2.0765	16 52 53.9	10.228
12	15 31 21.94	2.0824	17 3 5.6	10.160
13	15 33 27.07	2.0884	17 13 13.1	10.090
14	15 35 32.55	2.0944	17 23 16.4	10.019
15	15 37 38.39	2.1004	17 33 15.4	9.947
16	15 39 44.60	2.1065	17 43 10.0	9.873
17	15 41 51.17	2.1126	17 53 0.2	9.798
18	15 43 58.11	2.1187	18 2 45.8	9.723
19	15 46 5.42	2.1249	18 12 26.9	9.647
20	15 48 13.10	2.1311	18 22 3.4	9.568
21	15 50 21.15	2.1373	18 31 35.1	9.488
22	15 52 29.58	2.1436	18 41 2.0	9.407
23	15 54 38.38	2.1498	S. 18 50 24.0	9.326
	WEDNESDAY 30.			
0	15 56 47.56	2.1562	S. 18 59 41.1	9.242
1	15 58 57.12	2.1625	19 8 53.1	9.158
2	16 1 7.06	2.1688	19 18 0.0	9.072
3	16 3 17.38	2.1752	19 27 1.8	8.985
4	16 5 28.08	2.1816	19 35 58.3	8.897
5	16 7 39.17	2.1880	19 44 49.5	8.808
6	16 9 50.64	2.1943	19 53 35.3	8.717
7	16 12 2.49	2.2007	20 2 15.6	8.624
8	16 14 14.73	2.2072	20 10 50.3	8.532
9	16 16 27.36	2.2137	20 19 19.3	8.437
10	16 18 40.37	2.2201	20 27 42.6	8.340
11	16 20 53.77	2.2265	20 36 0.1	8.243
12	16 23 7.56	2.2330	20 44 11.8	8.145
13	16 25 21.73	2.2395	20 52 17.5	8.044
14	16 27 36.29	2.2458	21 0 17.1	7.942
15	16 29 51.24	2.2523	21 8 10.6	7.841
16	16 32 6.57	2.2588	21 15 58.0	7.737
17	16 34 22.29	2.2652	21 23 39.1	7.632
18	16 36 38.39	2.2716	21 31 13.8	7.525
19	16 38 54.88	2.2780	21 38 42.1	7.417
20	16 41 11.75	2.2844	21 46 3.8	7.307
21	16 43 29.01	2.2907	21 53 19.0	7.197
22	16 45 46.64	2.2971	22 0 27.5	7.086
23	16 48 4.66	2.3034	22 7 29.3	6.973
24	16 50 23.05	2.3097	S. 22 14 24.3	6.859

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	THURSDAY, JULY 1.			
	h m s	s	° ′ ″	″
0	16 50 23.05	2.3097	S. 22 14 24.3	6.859

PHASES OF THE MOON.

			d	h	m
○	Full Moon	June	3	13	24.7
☾	Last Quarter		10	14	42.6
●	New Moon		17	11	28.3
☽	First Quarter		25	6	42.8

			d	h
☾	Perigee	June	12	4.3
☾	Apogee		25	0.2

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	III^h	P. L. of Diff.	VI^h	P. L. of Diff.	IX^h	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
1	Pollux	W.	107 54 44	2885	109 27 23	2875	111 0 14	2864	112 33 19	2853
	Regulus	W.	71 50 47	2891	73 23 18	2880	74 56 3	2869	76 29 2	2858
	Jupiter	W.	64 27 11	2919	65 59 6	2909	67 31 14	2898	69 3 36	2886
	Spica	W.	18 33 36	3129	20 1 11	3086	21 29 38	3047	22 58 53	3012
	a Aquilæ	E.	79 49 55	3666	78 32 32	3665	77 15 8	3664	75 57 43	3665
	Mars	E.	113 43 26	3101	112 15 18	3089	110 46 55	3078	109 18 18	3066
2	Regulus	W.	84 17 32	2802	85 51 57	2791	87 26 37	2780	89 1 31	2769
	Jupiter	W.	76 49 2	2831	78 22 50	2819	79 56 53	2808	81 31 11	2797
	Spica	W.	30 34 23	2888	32 6 58	2869	33 39 57	2850	35 13 20	2831
	a Aquilæ	E.	69 31 12	3687	68 14 11	3696	66 57 19	3707	65 40 39	3720
	Mars	E.	101 51 40	3008	100 21 37	2996	98 51 19	2984	97 20 46	2972
3	Regulus	W.	96 59 44	2713	98 36 6	2702	100 12 43	2691	101 49 35	2681
	Jupiter	W.	89 26 18	2741	91 2 4	2730	92 38 4	2719	94 14 18	2708
	Spica	W.	43 5 41	2755	44 41 9	2741	46 16 55	2727	47 53 0	2713
	a Aquilæ	E.	59 21 31	3820	58 6 50	3850	56 52 40	3884	55 39 4	3922
	Mars	E.	89 44 16	2912	88 12 13	2901	86 39 56	2890	85 7 24	2878
4	Regulus	W.	109 57 25	2629	111 35 40	2619	113 14 9	2610	114 52 51	2600
	Jupiter	W.	102 19 3	2656	103 56 42	2646	105 34 34	2636	107 12 40	2626
	Spica	W.	55 57 41	2652	57 35 26	2640	59 13 27	2629	60 51 43	2618
	a Aquilæ	E.	49 42 3	4188	48 33 26	4261	47 25 57	4343	46 19 44	4436
	Mars	E.	77 21 4	2822	75 47 5	2811	74 12 52	2801	72 38 25	2791
	Saturn	E.	121 36 9	2648	119 58 19	2638	118 20 15	2627	116 41 57	2617
5	Spica	W.	69 6 46	2566	70 46 28	2556	72 26 24	2547	74 6 33	2538
	Antares	W.	23 24 18	2646	25 2 11	2626	26 40 31	2607	28 19 17	2589
	Mars	E.	64 42 49	2741	63 7 3	2731	61 31 4	2722	59 54 53	2713
	Saturn	E.	108 26 59	2568	106 47 20	2559	105 7 29	2550	103 27 25	2541
6	Spica	W.	82 30 21	2495	84 11 42	2487	85 53 13	2480	87 34 55	2472
	Antares	W.	36 38 39	2519	38 19 26	2507	40 0 30	2496	41 41 49	2486
	Mars	E.	51 51 2	2671	50 13 43	2663	48 36 13	2655	46 58 33	2647
	Saturn	E.	95 4 6	2499	93 22 52	2492	91 41 27	2485	89 59 52	2477
	a Arietis	E.	111 20 16	2604	109 41 26	2593	108 2 22	2583	106 23 4	2574
7	Spica	W.	96 5 56	2439	97 48 36	2433	99 31 24	2427	101 14 21	2421
	Antares	W.	50 11 41	2442	51 54 16	2435	53 37 1	2427	55 19 57	2420
	Mars	E.	38 47 46	2615	37 9 11	2609	35 30 27	2603	33 51 36	2598
	Saturn	E.	81 29 23	2442	79 46 48	2436	78 4 5	2430	76 21 13	2424
	a Arietis	E.	98 3 31	2533	96 23 3	2526	94 42 26	2519	93 1 39	2512
	Sun	E.	137 7 45	2723	135 31 36	2716	133 55 17	2709	132 18 49	2703
8	Antares	W.	63 57 1	2389	65 40 52	2383	67 24 52	2377	69 9 0	2372
	Saturn	E.	67 44 49	2396	66 1 9	2391	64 17 21	2386	62 33 26	2382
	a Arietis	E.	84 35 39	2486	82 54 6	2482	81 12 28	2478	79 30 44	2475
	Sun	E.	124 14 27	2673	122 37 11	2668	120 59 48	2663	119 22 18	2658
9	Antares	W.	77 51 25	2348	79 36 14	2344	81 21 10	2340	83 6 12	2336
	Saturn	E.	53 52 16	2360	52 7 44	2356	50 23 6	2352	48 38 22	2348
	a Arietis	E.	71 1 4	2464	69 19 0	2463	67 36 54	2462	65 54 48	2463

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XV^{h}	P. L. of Diff.	$\mathrm{XVIII}^{\mathrm{h}}$	P. L. of Diff.	$\mathrm{XXI}^{\mathrm{h}}$	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
1	Pollux	W.	114 6 38	2843	115 40 10	2832	117 13 56	2821	118 47 56	2811
	Regulus	W.	78 2 16	2847	79 35 43	2836	81 9 25	2825	82 43 21	2813
	JUPITER	W.	70 36 13	2875	72 9 4	2864	73 42 9	2853	75 15 28	2842
	Spica	W.	24 28 51	2982	25 59 26	2955	27 30 35	2931	29 2 15	2909
	a Aquilæ	E.	74 40 19	3666	73 22 56	3669	72 5 36	3674	70 48 21	3680
	MARS	E.	107 49 27	3055	106 20 22	3043	104 51 3	3031	103 21 29	3019
2	Regulus	W.	90 36 40	2758	92 12 4	2747	93 47 42	2735	95 23 36	2724
	JUPITER	W.	83 5 43	2786	84 40 30	2775	86 15 31	2763	87 50 47	2752
	Spica	W.	36 47 7	2815	38 21 15	2800	39 55 43	2784	41 30 32	2769
	a Aquilæ	E.	64 24 13	3735	63 8 2	3752	61 52 10	3772	60 36 39	3794
	MARS	E.	95 49 58	2960	94 18 55	2948	92 47 37	2936	91 16 4	2924
3	Regulus	W.	103 26 41	2670	105 4 1	2660	106 41 35	2649	108 19 23	2639
	JUPITER	W.	95 50 47	2698	97 27 30	2687	99 4 27	2677	100 41 38	2666
	Spica	W.	49 29 22	2700	51 6 2	2687	52 42 58	2675	54 20 12	2663
	a Aquilæ	E.	54 26 6	3964	53 13 50	4011	52 2 21	4063	50 51 43	4122
	MARS	E.	83 34 37	2866	82 1 35	2855	80 28 19	2844	78 54 49	2833
4	Regulus	W.	116 31 46	2591	118 10 54	2582	119 50 14	2573	121 29 47	2564
	JUPITER	W.	108 50 59	2617	110 29 31	2608	112 8 16	2599	113 47 13	2589
	Spica	W.	62 30 15	2607	64 9 1	2596	65 48 2	2585	67 27 17	2575
	a Aquilæ	E.	45 14 55	4540	44 11 37	4656	43 10 0	4786	42 10 12	4930
	MARS	E.	71 3 45	2780	69 28 51	2770	67 53 44	2760	66 18 23	2750
	SATURN	E.	115 3 24	2607	113 24 38	2597	111 45 38	2587	110 6 25	2577
5	Spica	W.	75 46 54	2529	77 27 28	2520	79 8 14	2511	80 49 12	2503
	Antares	W.	29 58 28	2572	31 38 1	2557	33 17 55	2543	34 58 8	2530
	MARS	E.	58 18 30	2704	56 41 55	2695	55 5 9	2687	53 28 11	2679
	SATURN	E.	101 47 9	2533	100 6 41	2524	98 26 1	2515	96 45 9	2507
6	Spica	W.	89 16 48	2465	90 58 51	2458	92 41 3	2451	94 23 25	2445
	Antares	W.	43 23 22	2477	45 5 8	2468	46 47 7	2459	48 29 18	2450
	MARS	E.	45 20 42	2640	43 42 42	2633	42 4 32	2627	40 26 13	2621
	SATURN	E.	88 18 6	2470	86 36 10	2462	84 54 4	2455	83 11 48	2449
	a Arietis	E.	104 43 34	2565	103 3 51	2556	101 23 56	2548	99 43 49	2540
7	Spica	W.	102 57 26	2415	104 40 39	2410	106 23 59	2405	108 7 26	2401
	Antares	W.	57 3 3	2413	58 46 19	2407	60 29 44	2401	62 13 18	2395
	MARS	E.	32 12 37	2593	30 33 32	2588	28 54 20	2584	27 15 3	2580
	SATURN	E.	74 38 12	2418	72 55 4	2412	71 11 47	2407	69 28 22	2401
	a Arietis	E.	91 20 42	2506	89 39 37	2501	87 58 25	2496	86 17 5	2491
	SUN	E.	130 42 13	2697	129 5 29	2690	127 28 36	2684	125 51 35	2679
8	Antares	W.	70 53 15	2367	72 37 38	2362	74 22 7	2357	76 6 43	2353
	SATURN	E.	60 49 25	2377	59 5 17	2373	57 21 3	2368	55 36 43	2364
	a Arietis	E.	77 48 55	2472	76 7 2	2470	74 25 6	2467	72 43 6	2465
	SUN	E.	117 44 41	2653	116 6 58	2648	114 29 8	2643	112 51 11	2638
9	Antares	W.	84 51 19	2332	86 36 31	2328	88 21 49	2325	90 7 12	2322
	SATURN	E.	46 53 33	2345	45 8 39	2342	43 23 41	2339	41 38 39	2336
	a Arietis	E.	64 12 43	2464	62 30 39	2465	60 48 36	2467	59 6 36	2470

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	III^{h}	P. L. of Diff.	VI^{h}	P. L. of Diff.	IX^{h}	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
9	SUN	E.	111 13 8	2634	109 34 59	2629	107 56 44	2625	106 18 23	2621
10	Antares	W.	91 52 39	2319	93 38 11	2316	95 23 47	2313	97 9 28	2311
	α Aquilæ	W.	51 52 38	3672	53 9 55	3606	54 28 23	3545	55 47 57	3491
	SATURN	E.	39 53 32	2333	38 8 21	2331	36 23 6	2328	34 37 48	2326
	α Arietis	E.	57 24 41	2473	55 42 50	2477	54 1 5	2482	52 19 27	2489
	SUN	E.	98 5 22	2603	96 26 31	2600	94 47 36	2597	93 8 37	2594
11	Antares	W.	105 58 43	2300	107 44 43	2298	109 30 45	2297	111 16 50	2296
	α Aquilæ	W.	62 39 30	3279	64 4 5	3247	65 29 18	3218	66 55 5	3192
	MARS	W.	15 8 7	2511	16 49 5	2502	18 30 16	2494	20 11 39	2487
	SATURN	E.	25 50 38	2321	24 5 8	2321	22 19 39	2322	20 34 10	2323
	α Arietis	E.	43 54 13	2543	42 13 59	2560	40 34 9	2580	38 54 46	2602
	SUN	E.	84 52 41	2581	83 13 20	2579	81 33 56	2577	79 54 29	2575
12	α Aquilæ	W.	74 11 1	3094	75 39 18	3080	77 7 52	3068	78 36 41	3057
	MARS	W.	28 40 35	2465	30 22 37	2463	32 4 43	2461	33 46 51	2459
	SUN	E.	71 36 41	2569	69 57 3	2568	68 17 24	2567	66 37 44	2567
13	α Aquilæ	W.	86 3 17	3030	87 32 53	3028	89 2 31	3029	90 32 8	3031
	MARS	W.	42 17 56	2457	44 0 10	2458	45 42 23	2458	47 24 35	2459
	SUN	E.	58 19 25	2569	56 39 48	2570	55 0 12	2572	53 20 38	2574
14	α Aquilæ	W.	97 58 54	3065	99 27 47	3075	100 56 27	3088	102 24 51	3104
	MARS	W.	55 55 3	2470	57 36 59	2473	59 18 51	2476	61 0 38	2480
	SATURN	W.	16 46 33	2337	18 31 38	2337	20 16 44	2336	22 1 51	2337
	SUN	E.	45 3 33	2587	43 24 19	2590	41 45 11	2594	40 6 7	2598
15	MARS	W.	69 28 6	2503	71 9 15	2509	72 50 16	2515	74 31 8	2521
	SATURN	W.	30 46 43	2353	32 31 26	2357	34 16 2	2362	36 0 31	2368
	SUN	E.	31 52 27	2625	30 14 6	2630	28 35 52	2636	26 57 45	2643
19	SUN	W.	18 55 31	2976	20 26 14	2989	21 56 41	3003	23 26 50	3017
	JUPITER	E.	51 35 44	2704	49 59 9	2718	48 22 53	2733	46 46 57	2748
	Spica	E.	96 22 38	2669	94 45 17	2682	93 8 13	2695	91 31 27	2709
20	SUN	W.	30 53 14	3088	32 21 38	3102	33 49 45	3116	35 17 35	3130
	JUPITER	E.	38 52 9	2823	37 18 11	2838	35 44 33	2854	34 11 15	2870
	Spica	E.	83 32 5	2776	81 57 6	2790	80 22 25	2803	78 48 1	2816
21	SUN	W.	42 32 35	3198	43 58 46	3211	45 24 42	3224	46 50 23	3236
	Pollux	W.	19 53 37	2920	21 25 30	2925	22 57 17	2931	24 28 57	2936
	JUPITER	E.	26 30 5	2958	24 58 59	2977	23 28 16	2997	21 57 59	3018
	Spica	E.	71 0 16	2881	69 27 33	2894	67 55 7	2907	66 22 57	2919
	Antares	E.	116 54 23	2875	115 21 32	2886	113 48 55	2898	112 16 33	2909
22	SUN	W.	53 55 13	3295	55 19 30	3306	56 43 35	3316	58 7 28	3326
	Pollux	W.	32 5 20	2971	33 36 9	2978	35 6 49	2986	36 37 19	2993
	Spica	E.	58 45 54	2977	57 15 13	2989	55 44 47	3000	54 14 34	3011
	Antares	E.	104 38 9	2961	103 7 7	2971	101 36 18	2980	100 5 40	2989
23	SUN	W.	65 4 8	3371	66 26 58	3378	67 49 39	3385	69 12 13	3392

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh	P. L. of Diff.	XVIIIh	P. L. of Diff.	XXIh	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
9	SUN	E.	104 39 57	2618	103 1 26	2614	101 22 50	2610	99 44 8	2607
10	Antares	W.	98 55 12	2308	100 41 0	2306	102 26 51	2304	104 12 46	2302
	α Aquilæ	W.	57 8 31	3441	58 30 1	3394	59 52 24	3352	61 15 35	3314
	SATURN	E.	32 52 26	2324	31 7 2	2323	29 21 36	2322	27 36 8	2321
	α Arietis	E.	50 37 59	2497	48 56 42	2506	47 15 37	2516	45 34 46	2528
	SUN	E.	91 29 33	2591	89 50 25	2588	88 11 14	2585	86 31 59	2583
11	Antares	W.	113 2 56	2295	114 49 4	2294	116 35 12	2293	118 21 21	2293
	α Aquilæ	W.	68 21 24	3168	69 48 11	3146	71 15 25	3127	72 43 2	3109
	MARS	W.	21 53 12	2480	23 34 53	2475	25 16 42	2471	26 58 36	2468
	SATURN	E.	18 48 44	2326	17 3 23	2331	15 18 9	2339	13 33 6	2350
	α Arietis	E.	37 15 53	2628	35 37 36	2659	34 0 1	2695	32 23 15	2738
	SUN	E.	78 14 59	2573	76 35 27	2572	74 55 53	2571	73 16 18	2570
12	*α* Aquilæ	W.	80 5 43	3049	81 34 55	3042	83 4 16	3036	84 33 44	3032
	MARS	W.	35 29 2	2458	37 11 14	2458	38 53 27	2457	40 35 41	2456
	SUN	E.	64 58 4	2567	63 18 24	2567	61 38 44	2567	59 59 4	2567
13	*α* Aquilæ	W.	92 1 42	3035	93 31 11	3040	95 0 34	3047	96 29 49	3055
	MARS	W.	49 6 46	2461	50 48 54	2463	52 31 1	2465	54 13 4	2467
	SUN	E.	51 41 7	2576	50 1 38	2578	48 22 13	2580	46 42 51	2583
14	*α* Aquilæ	W.	103 52 56	3120	105 20 41	3138	106 48 4	3158	108 15 3	3182
	MARS	W.	62 42 20	2484	64 23 56	2488	66 5 26	2493	67 46 49	2498
	SATURN	W.	23 46 56	2339	25 31 59	2341	27 16 59	2344	29 1 54	2348
	SUN	E.	38 27 9	2602	36 48 17	2608	35 9 32	2614	33 30 56	2619
15	MARS	W.	76 11 52	2528	77 52 26	2535	79 32 51	2543	81 13 5	2551
	SATURN	W.	37 44 51	2374	39 29 3	2381	41 13 5	2388	42 56 57	2396
	SUN	E.	25 19 48	2651	23 42 2	2660	22 4 28	2669	20 27 6	2678
19	SUN	W.	24 56 42	3031	26 26 16	3045	27 55 33	3059	29 24 32	3073
	JUPITER	E.	45 11 20	2763	43 36 3	2777	42 1 5	2792	40 26 27	2808
	Spica	E.	89 54 59	2722	88 18 49	2736	86 42 57	2749	85 7 22	2763
20	SUN	W.	36 45 8	3144	38 12 24	3158	39 39 24	3171	41 6 7	3184
	JUPITER	E.	32 38 18	2887	31 5 42	2903	29 33 27	2920	28 1 34	2939
	Spica	E.	77 13 54	2829	75 40 4	2842	74 6 32	2855	72 33 16	2868
21	SUN	W.	48 15 50	3248	49 41 2	3260	51 5 59	3272	52 30 43	3284
	Pollux	W.	26 0 30	2942	27 31 56	2949	29 3 13	2956	30 34 21	2963
	JUPITER	E.	20 28 9	3043	18 58 50	3072	17 30 6	3104	16 2 1	3140
	Spica	E.	64 51 2	2931	63 19 23	2943	61 47 59	2954	60 16 49	2966
	Antares	E.	110 44 25	2920	109 12 31	2931	107 40 51	2941	106 9 24	2951
22	SUN	W.	59 31 10	3336	60 54 40	3345	62 17 59	3354	63 41 8	3362
	Pollux	W.	38 7 40	3001	39 37 51	3008	41 7 54	3015	42 37 48	3022
	Spica	E.	52 44 35	3022	51 14 49	8032	49 45 16	3042	48 15 55	3052
	Antares	E.	98 35 13	2997	97 4 57	3006	95 34 52	3014	94 4 57	3022
23	SUN	W.	70 34 39	3398	71 56 58	3404	73 19 10	3409	74 41 16	3414

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh	P. L. of Diff.	VIh	P. L. of Diff.	IXh	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
23	Pollux	W.	44 7 34	3029	45 37 11	3034	47 6 41	3040	48 36 4	3046
	Spica	E.	46 46 47	3062	45 17 51	3072	43 49 7	3081	42 20 34	3091
	Antares	E.	92 35 11	3030	91 5 35	3037	89 36 8	3043	88 6 48	3049
24	SUN	W.	76 3 17	3418	77 25 13	3422	78 47 4	3425	80 8 52	3428
	Pollux	W.	56 1 27	3067	57 30 17	3070	58 59 3	3073	60 27 46	3075
	Regulus	W.	20 16 38	3161	21 43 34	3154	23 10 38	3147	24 37 51	3140
	Spica	E.	35 0 44	3139	33 33 21	3149	32 6 11	3160	30 39 14	3172
	Antares	E.	80 41 54	3073	79 13 12	3077	77 44 35	3080	76 16 2	3083
25	SUN	W.	86 57 17	3434	88 18 55	3434	89 40 33	3433	91 2 12	3432
	Pollux	W.	67 50 50	3079	69 19 25	3078	70 48 1	3077	72 16 38	3076
	Regulus	W.	31 55 40	3116	33 23 30	3113	34 51 24	3109	36 19 23	3105
	JUPITER	W.	21 49 38	3195	23 15 53	3188	24 42 17	3180	26 8 50	3173
	Antares	E.	68 53 56	3091	67 25 35	3091	65 57 14	3090	64 28 52	3089
	a Aquilæ	E.	113 14 38	3990	112 2 49	3972	110 50 41	3954	109 38 16	3936
26	SUN	W.	97 51 5	3416	99 13 3	3412	100 35 5	3407	101 57 13	3401
	Pollux	W.	79 40 22	3061	81 9 18	3057	82 38 20	3052	84 7 28	3047
	Regulus	W.	43 40 38	3081	45 9 11	3075	46 37 51	3069	48 6 39	3063
	JUPITER	W.	33 23 37	3140	34 50 58	3133	36 18 27	3126	37 46 5	3119
	Antares	E.	57 6 40	3079	55 38 5	3076	54 9 27	3073	52 40 44	3069
	a Aquilæ	E.	103 31 57	3859	102 17 56	3846	101 3 42	3833	99 49 14	3820
27	SUN	W.	108 49 42	3366	110 12 37	3358	111 35 41	3349	112 58 56	3340
	Regulus	W.	55 32 41	3026	57 2 22	3018	58 32 13	3009	60 2 15	3000
	JUPITER	W.	45 6 27	3080	46 35 1	3071	48 3 46	3062	49 32 42	3052
	Antares	E.	45 15 46	3044	43 46 27	3039	42 17 2	3033	40 47 30	3026
	a Aquilæ	E.	93 33 54	3767	92 18 17	3758	91 2 31	3749	89 46 35	3740
28	SUN	W.	119 57 57	3288	121 22 23	3276	122 47 2	3265	124 11 55	3253
	Regulus	W.	67 35 24	2949	69 6 41	2938	70 38 12	2926	72 9 58	2914
	JUPITER	W.	57 0 25	3001	58 30 37	2989	60 1 3	2977	61 31 44	2966
	Antares	E.	33 17 56	2997	31 47 39	2993	30 17 17	2989	28 46 50	2985
	a Aquilæ	E.	83 24 53	3706	82 8 12	3701	80 51 26	3697	79 34 35	3693
	Fomalhaut	E.	115 51 23	3145	114 24 8	3129	112 56 33	3113	111 28 39	3097
29	Regulus	W.	79 52 35	2852	81 25 55	2839	82 59 32	2826	84 33 26	2813
	JUPITER	W.	69 8 58	2902	70 41 14	2889	72 13 46	2876	73 46 36	2862
	Spica	W.	26 15 39	2966	27 46 34	2943	29 17 59	2920	30 49 53	2898
	a Aquilæ	E.	73 9 41	3689	71 52 41	3691	70 35 44	3695	69 18 52	3700
	Fomalhaut	E.	104 4 27	3021	102 34 40	3005	101 4 34	2990	99 34 9	2975
	a Pegasi	E.	120 37 34	3408	119 15 27	3380	117 52 48	3351	116 29 35	3323
	MARS	E.	121 39 34	3026	120 9 53	3011	118 39 54	2997	117 9 37	2983
30	Regulus	W.	92 27 21	2744	94 3 3	2730	95 39 3	2715	97 15 23	2701
	JUPITER	W.	81 35 10	2792	83 9 48	2778	84 44 45	2764	86 20 1	2750
	Spica	W.	38 36 16	2796	40 10 49	2777	41 45 47	2760	43 21 8	2742
	a Aquilæ	E.	62 56 27	3753	61 40 36	3771	60 25 4	3792	59 9 53	3815
	Fomalhaut	E.	91 57 26	2902	90 25 10	2888	88 52 36	2874	87 19 44	2861
	a Pegasi	E.	109 25 47	3198	107 59 35	3175	106 32 56	3153	105 5 50	3132
	MARS	E.	109 33 44	2909	108 1 37	2895	106 29 12	2880	104 56 27	2865

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XV^h	P. L. of Diff.	XVIII^h	P. L. of Diff.	XXI^h	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
23	Pollux	W.	50 5 20	3051	51 34 30	3056	53 3 34	3060	54 32 33	3064
	Spica	E.	40 52 13	3100	39 24 3	3110	37 56 5	3119	36 28 19	3129
	Antares	E.	86 37 36	3055	85 8 31	3060	83 39 33	3065	82 10 41	3069
24	SUN	W.	81 30 37	3430	82 52 19	3432	84 13 59	3433	85 35 38	3434
	Pollux	W.	61 56 26	3077	63 25 4	3078	64 53 40	3079	66 22 15	3079
	Regulus	W.	26 5 12	3134	27 32 40	3129	29 0 15	3124	30 27 55	3120
	Spica	E.	29 12 31	3184	27 46 3	3198	26 19 51	3213	24 53 57	3230
	Antares	E.	74 47 32	3086	73 19 5	3088	71 50 41	3089	70 22 18	3090
25	SUN	W.	92 23 53	3430	93 45 36	3427	95 7 22	3424	96 29 12	3420
	Pollux	W.	73 45 17	3074	75 13 58	3072	76 42 42	3069	78 11 30	3065
	Regulus	W.	37 47 27	3101	39 15 36	3096	40 43 51	3091	42 12 11	3086
	JUPITER	W.	27 35 31	3166	29 2 20	3159	30 29 18	3153	31 56 24	3147
	Antares	E.	63 0 30	3088	61 32 6	3086	60 3 40	3084	58 35 11	3082
	α Aquilæ	E.	108 25 33	3919	107 12 33	3903	105 59 16	3888	104 45 44	3873
26	SUN	W.	103 19 28	3395	104 41 50	3389	106 4 19	3382	107 26 56	3374
	Pollux	W.	85 36 42	3042	87 6 3	3036	88 35 31	3029	90 5 8	3022
	Regulus	W.	49 35 34	3056	51 4 37	3049	52 33 49	3042	54 3 10	3034
	JUPITER	W.	39 13 51	3112	40 41 46	3105	42 9 50	3097	43 38 3	3088
	Antares	E.	51 11 56	3064	49 43 2	3060	48 14 3	3055	46 44 58	3049
	α Aquilæ	E.	98 34 33	3808	97 19 40	3798	96 4 36	3787	94 49 21	3776
27	SUN	W.	114 22 21	3330	115 45 57	3320	117 9 45	3310	118 33 45	3300
	Regulus	W.	61 32 28	2990	63 2 53	2980	64 33 30	2970	66 4 20	2959
	JUPITER	W.	51 1 50	3043	52 31 10	3033	54 0 42	3022	55 30 27	3012
	Antares	E.	39 17 50	3020	37 48 2	3015	36 18 8	3009	34 48 6	3003
	α Aquilæ	E.	88 30 30	3732	87 14 17	3725	85 57 56	3718	84 41 28	3712
28	SUN	W.	125 37 2	3240	127 2 24	3227	128 28 0	3214	129 53 52	3200
	Regulus	W.	73 41 58	2902	75 14 14	2890	76 46 44	2878	78 19 31	2865
	JUPITER	W.	63 2 39	2954	64 33 50	2941	66 5 16	2928	67 36 59	2915
	Antares	E.	27 16 18	2983	25 45 44	2983	24 15 10	2984	22 44 37	2986
	α Aquilæ	E.	78 17 40	3690	77 0 42	3688	75 43 42	3687	74 26 41	3688
	Fomalhaut	E.	110 0 26	3082	108 31 54	3067	107 3 4	3052	105 33 55	3036
29	Regulus	W.	86 7 37	2799	87 42 6	2785	89 16 53	2772	90 51 58	2758
	JUPITER	W.	75 19 43	2848	76 53 8	2835	78 26 50	2821	80 0 51	2807
	Spica	W.	32 22 15	2876	33 55 5	2854	35 28 23	2834	37 2 7	2815
	α Aquilæ	E.	68 2 5	3707	66 45 25	3715	65 28 54	3726	64 12 34	3738
	Fomalhaut	E.	98 3 25	2961	96 32 23	2946	95 1 3	2931	93 29 24	2916
	α Pegasi	E.	115 5 50	3296	113 41 34	3270	112 16 48	3245	110 51 32	3221
	MARS	E.	115 39 3	2969	114 8 11	2954	112 37 1	2939	111 5 32	2924
30	Regulus	W.	98 52 1	2687	100 28 58	2673	102 6 14	2659	103 43 49	2645
	JUPITER	W.	87 55 35	2735	89 31 28	2721	91 7 40	2707	92 44 11	2692
	Spica	W.	44 56 52	2725	46 32 59	2708	48 9 28	2691	49 46 20	2675
	α Aquilæ	E.	57 55 5	3841	56 40 45	3871	55 26 57	3907	54 13 44	3946
	Fomalhaut	E.	85 46 35	2848	84 13 9	2834	82 39 25	2821	81 5 24	2808
	α Pegasi	E.	103 38 19	3112	102 10 23	3092	100 42 4	3073	99 13 22	3055
	MARS	E.	103 23 23	2850	101 50 0	2835	100 16 17	2820	98 42 14	2805

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Semi-diameter.	Sidereal Time of Semi-diameter Passing Meridian.	Equation of Time, to be Added to Apparent Time.	Diff. for 1 Hour.
		h m s	s	° ′ ″	″	′ ″	s	m s	s
Thur.	1	6 39 4.94	10.342	N.23 8 51.2	– 9.66	15 45.69	68.75	3 28.98	0.484
Frid.	2	6 43 13.01	10.331	23 4 47.3	10.67	15 45.69	68.71	3 40.46	0.473
Sat.	3	6 47 20.82	10.319	23 0 19.2	11.67	15 45.68	68.68	3 51.68	0.462
SUN.	4	6 51 28.35	10.307	22 55 27.0	– 12.67	15 45.68	68.65	4 2.62	0.449
Mon.	5	6 55 35.56	10.294	22 50 10.8	13.67	15 45.69	68.61	4 13.25	0.436
Tues.	6	6 59 42.45	10.280	22 44 30.8	14.66	15 45.69	68.56	4 23.55	0.423
Wed.	7	7 3 49.01	10.266	22 38 27.2	– 15.64	15 45.70	68.51	4 33.52	0.408
Thur.	8	7 7 55.22	10.251	22 32 0.1	16.62	15 45.71	68.46	4 43.15	0.394
Frid.	9	7 12 1.07	10.236	22 25 9.6	17.59	15 45.73	68.41	4 52.42	0.378
Sat.	10	7 16 6.54	10.220	22 17 55.8	– 18.56	15 45.75	68.35	5 1.31	0.362
SUN.	11	7 20 11.61	10.203	22 10 18.9	19.51	15 45.78	68.29	5 9.80	0.345
Mon.	12	7 24 16.27	10.185	22 2 19.2	20.46	15 45.81	68.22	5 17.87	0.328
Tues.	13	7 28 20.49	10.166	21 53 56.7	– 21.40	15 45.84	68.16	5 25.52	0.309
Wed.	14	7 32 24.26	10.147	21 45 11.6	22.34	15 45.88	68.09	5 32.72	0.290
Thur.	15	7 36 27.56	10.127	21 36 4.3	23.27	15 45.93	68.02	5 39.44	0.270
Frid.	16	7 40 30.38	10.107	21 26 34.9	– 24.19	15 45.98	67.95	5 45.68	0.250
Sat.	17	7 44 32.70	10.086	21 16 43.5	25.09	15 46.04	67.88	5 51.42	0.228
SUN.	18	7 48 34.48	10.063	21 6 30.3	25.99	15 46.10	67.80	5 56.63	0.206
Mon.	19	7 52 35.72	10.040	20 55 55.6	– 26.88	15 46.17	67.73	6 1.30	0.184
Tues.	20	7 56 36.42	10.017	20 44 59.8	27.77	15 46.24	67.65	6 5.43	0.161
Wed.	21	8 0 36.55	9.994	20 33 43.0	28.63	15 46.32	67.57	6 9.00	0.137
Thur.	22	8 4 36.11	9.970	20 22 5.5	– 29.49	15 46.40	67.49	6 12.00	0.113
Frid.	23	8 8 35.09	9.945	20 10 7.5	30.34	15 46.49	67.41	6 14.42	0.088
Sat.	24	8 12 33.47	9.920	19 57 49.2	31.17	15 46.58	67.33	6 16.23	0.063
SUN.	25	8 16 31.24	9.895	19 45 11.1	– 32.00	15 46.68	67.25	6 17.44	0.038
Mon.	26	8 20 28.40	9.869	19 32 13.3	32.81	15 46.79	67.16	6 18.05	0.013
Tues.	27	8 24 24.96	9.844	19 18 56.0	33.62	15 46.90	67.08	6 18.05	0.013
Wed.	28	8 28 20.91	9.818	19 5 19.6	– 34.41	15 47.01	66.99	6 17.44	0.038
Thur.	29	8 32 16.23	9.792	18 51 24.3	35.19	15 47.12	66.91	6 16.21	0.064
Frid.	30	8 36 10.93	9.766	18 37 10.5	35.95	15 47.23	66.82	6 14.35	0.090
Sat.	31	8 40 5.02	9.740	18 22 38.4	36.71	15 47.35	66.73	6 11.89	0.115
SUN.	32	8 43 58.50	9.715	N.18 7 48.3	– 37.46	15 47.47	66.64	6 8.82	0.140

Note.—The mean time of semidiameter passing the meridian may be found by subtracting 0s.19 from the sidereal time. The sign – prefixed to the hourly change of declination indicates that north declinations are decreasing.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Equation of Time, to be Subtracted from Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		h m s	s	° ′ ″	″	m s	s	h m s
Thur.	1	6 39 4.34	10.340	N.23 8 51.8	− 9.66	3 28.95	0.484	6 35 35.39
Frid.	2	6 43 12.38	10.330	23 4 47.9	10.67	3 40.43	0.473	6 39 31.95
Sat.	3	6 47 20.16	10.318	23 0 19.9	11.67	3 51.65	0.462	6 43 28.51
SUN.	4	6 51 27.65	10.306	22 55 27.8	− 12.67	4 2.58	0.449	6 47 25.07
Mon.	5	6 55 34.83	10.293	22 50 11.7	13.67	4 13.21	0.436	6 51 21.62
Tues.	6	6 59 41.70	10.279	22 44 31.9	14.66	4 23.52	0.423	6 55 18.18
Wed.	7	7 3 48.24	10.265	22 38 28.4	− 15.64	4 33.50	0.408	6 59 14.74
Thur.	8	7 7 54.43	10.250	22 32 1.4	16.62	4 43.13	0.394	7 3 11.30
Frid.	9	7 12 0.25	10.235	22 25 11.0	17.59	4 52.39	0.378	7 7 7.85
Sat.	10	7 16 5.69	10.219	22 17 57.3	− 18.56	5 1.28	0.362	7 11 4.41
SUN.	11	7 20 10.74	10.202	22 10 20.6	19.51	5 9.77	0.345	7 15 0.97
Mon.	12	7 24 15.37	10.184	22 2 21.0	20.46	5 17.84	0.328	7 18 57.53
Tues.	13	7 28 19.57	10.166	21 53 58.6	− 21.40	5 25.49	0.309	7 22 54.08
Wed.	14	7 32 23.33	10.146	21 45 13.7	22.34	5 32.69	0.290	7 26 50.64
Thur.	15	7 36 26.62	10.126	21 36 6.5	23.27	5 39.42	0.270	7 30 47.20
Frid.	16	7 40 29.42	10.106	21 26 37.2	− 24.19	5 45.66	0.250	7 34 43.76
Sat.	17	7 44 31.71	10.085	21 16 45.9	25.09	5 51.40	0.228	7 38 40.31
SUN.	18	7 48 33.48	10.063	21 6 32.8	25.99	5 56.61	0.206	7 42 36.87
Mon.	19	7 52 34.71	10.041	20 55 58.3	− 26.89	6 1.28	0.184	7 46 33.43
Tues.	20	7 56 35.40	10.017	20 45 2.6	27.77	6 5.42	0.161	7 50 29.98
Wed.	21	8 0 35.53	9.993	20 33 45.9	28.63	6 8.99	0.137	7 54 26.54
Thur.	22	8 4 35.08	9.969	20 22 8.5	− 29.49	6 11.99	0.113	7 58 23.10
Frid.	23	8 8 34.05	9.945	20 10 10.6	30.34	6 14.40	0.088	8 2 19.65
Sat.	24	8 12 32.43	9.920	19 57 52.4	31.17	6 16.22	0.063	8 6 16.21
SUN.	25	8 16 30.20	9.895	19 45 14.4	− 32.00	6 17.44	0.038	8 10 12.77
Mon.	26	8 20 27.37	9.870	19 32 16.7	32.81	6 18.05	0.013	8 14 9.32
Tues.	27	8 24 23.93	9.844	19 18 59.5	33.61	6 18.05	0.013	8 18 5.88
Wed.	28	8 28 19.88	9.818	19 5 23.1	− 34.41	6 17.44	0.038	8 22 2.44
Thur.	29	8 32 15.21	9.792	18 51 27.9	35.19	6 16.22	0.064	8 25 58.99
Frid.	30	8 36 9.92	9.767	18 37 14.2	35.95	6 14.37	0.090	8 29 55.55
Sat.	31	8 40 4.02	9.742	18 22 42.2	36.71	6 11.91	0.115	8 33 52.11
SUN.	32	8 43 57.51	9.717	N.18 7 52.2	− 37.46	6 8.84	0.140	8 37 48.66

NOTE.—The semidiameter for mean noon may be assumed the same as that for apparent noon.
The sign − prefixed to the hourly change of declination indicates that north declinations are decreasing.

Diff. for 1 Hour,
+9ˢ.8565.
(Table III.)

AT GREENWICH MEAN NOON.

Day of the Month.	Day of the Year.	THE SUN'S TRUE LONGITUDE. λ	TRUE LONGITUDE. λ′	Diff. for 1 Hour.	LATITUDE.	Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.
		° ′ ″	′ ″	″	″			h m s
1	182	98 58 49.9	58 41.2	142.95	+ 0.36	0.007 1987	+ 1.6	17 21 33.51
2	183	99 56 0.5	55 51.6	142.94	0.21	0.007 2018	1.0	17 17 37.60
3	184	100 53 11.1	53 2.0	142.94	+ 0.08	0.007 2035	+ 0.4	17 13 41.68
4	185	101 50 21.6	50 12.3	142.94	— 0.04	0.007 2037	- 0.2	17 9 45.77
5	186	102 47 32.2	47 22.7	142.95	0.14	0.007 2026	0.8	17 5 49.86
6	187	103 44 43.0	44 33.3	142.96	0.20	0.007 1999	1.4	17 1 53.95
7	188	104 41 54.0	41 44.2	142.97	— 0.25	0.007 1957	- 2.1	16 57 58.04
8	189	105 39 5.5	38 55.5	142.99	0.25	0.007 1898	2.8	16 54 2.12
9	190	106 36 17.4	36 7.2	143.01	0.22	0.007 1822	3.6	16 50 6.21
10	191	107 33 29.8	33 19.4	143.03	— 0.17	0.007 1726	- 4.4	16 46 10.30
11	192	108 30 42.6	30 32.1	143.05	— 0.08	0.007 1610	5.3	16 42 14.39
12	193	109 27 56.1	27 45.4	143.07	+ 0.03	0.007 1472	6.3	16 38 18.48
13	194	110 25 10.1	24 59.2	143.09	+ 0.16	0.007 1310	- 7.3	16 34 22.57
14	195	111 22 24.6	22 13.5	143.11	0.29	0.007 1124	8.3	16 30 26.66
15	196	112 19 39.6	19 28.4	143.13	0.43	0.007 0913	9.3	16 26 30.74
16	197	113 16 55.1	16 43.7	143.15	+ 0.56	0.007 0676	- 10.4	16 22 34.83
17	198	114 14 11.1	13 59.6	143.17	0.67	0.007 0414	11.5	16 18 38.92
18	199	115 11 27.5	11 15.8	143.19	0.76	0.007 0125	12.6	16 14 43.01
19	200	116 8 44.3	8 32.4	143.21	+ 0.82	0.006 9811	- 13.6	16 10 47.10
20	201	117 6 1.5	5 49.5	143.22	0.87	0.006 9472	14.6	16 6 51.19
21	202	118 3 19.1	3 6.9	143.24	0.89	0.006 9109	15.6	16 2 55.28
22	203	119 0 37.0	0 24.7	143.26	+ 0.88	0.006 8722	- 16.6	15 58 59.37
23	204	119 57 55.4	57 42.9	143.27	0.84	0.006 8313	17.5	15 55 3.46
24	205	120 55 14.1	55 1.4	143.29	0.78	0.006 7883	18.4	15 51 7.54
25	206	121 52 33.2	52 20.4	143.30	+ 0.70	0.006 7432	- 19.2	15 47 11.63
26	207	122 49 52.8	49 39.8	143.32	0.59	0.006 6962	20.0	15 43 15.72
27	208	123 47 12.8	46 59.6	143.34	0.46	0.006 6474	20.7	15 39 19.81
28	209	124 44 33.3	44 20.0	143.37	+ 0.33	0.006 5969	- 21.4	15 35 23.90
29	210	125 41 54.3	41 40.8	143.39	0.20	0.006 5448	22.0	15 31 27.99
30	211	126 39 15.9	39 2.3	143.42	+ 0.07	0.006 4912	22.6	15 27 32.08
31	212	127 36 38.2	36 24.5	143.45	— 0.05	0.006 4363	23.1	15 23 36.17
32	213	128 34 1.4	33 47.4	143.48	— 0.15	0.006 3802	- 23.6	15 19 40.26

Note.—The numbers in column λ correspond to the true equinox of the date; in column λ′ to the mean equinox of January 0d.0.

Diff. for 1 Hour,
— 9s.8296.
(Table II.)

GREENWICH MEAN TIME.

THE MOON'S

Day of the Month.	SEMIDIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
	′ ″	′ ″	′ ″	″	′ ″	″	h m	m	d
1	15 31.4	15 37.1	56 52.2	+ 1.75	57 13.2	+ 1.74	10 37.9	2.29	13.5
2	15 42.7	15 48.2	57 33.9	1.69	57 53.8	1.61	11 34.7	2.43	14.5
3	15 53.3	15 58.1	58 12.6	1.50	58 30.0	1.37	12 33.9	2.49	15.5
4	16 2.2	16 6.0	58 45.5	+ 1.21	58 59.1	+ 1.04	13 33.4	2.46	16.5
5	16 9.0	16 11.5	59 10.5	0.85	59 19.7	0.67	14 31.3	2.36	17.5
6	16 13.4	16 14.6	59 26.6	0.48	59 31.1	+ 0.29	15 26.6	2.24	18.5
7	16 15.3	16 15.4	59 33.5	+ 0.11	59 33.8	− 0.05	16 19.1	2.14	19.5
8	16 15.0	16 14.1	59 32.3	− 0.20	59 29.0	0.34	17 9.4	2.06	20.5
9	16 12.8	16 11.1	59 24.2	0.46	59 18.0	0.57	17 58.6	2.04	21.5
10	16 9.1	16 6.7	59 10.6	− 0.66	59 2.1	− 0.75	18 47.8	2.07	22.5
11	16 4.2	16 1.4	58 52.6	0.82	58 42.4	0.89	19 38.1	2.13	23.5
12	15 58.4	15 55.1	58 31.3	0.95	58 19.4	1.02	20 30.3	2.22	24.5
13	15 51.7	15 48.1	58 6.9	− 1.07	57 53.6	− 1.13	21 24.5	2.30	25.5
14	15 44.3	15 40.4	57 39.8	1.18	57 25.4	1.23	22 20.3	2.34	26.5
15	15 36.3	15 32.2	57 10.4	1.27	56 55.0	1.30	23 16.5	2.33	27.5
16	15 27.9	15 23.5	56 39.3	− 1.32	56 23.4	− 1.33	6	. . .	28.5
17	15 19.2	15 14.9	56 7.5	1.32	55 51.7	1.30	0 11.4	2.24	0.1
18	15 10.7	15 6.7	55 36.3	1.26	55 21.5	1.20	1 3.8	2.12	1.1
19	15 2.9	14 59.3	55 7.5	− 1.12	54 54.5	− 1.03	1 52.9	1.97	2.1
20	14 56.0	14 53.3	54 42.8	0.91	54 32.5	0.78	2 38.7	1.85	3.1
21	14 51.0	14 49.2	54 24.0	0.63	54 17.3	0.47	3 21.7	1.75	4.1
22	14 48.0	14 47.3	54 12.7	− 0.29	54 10.3	− 0.10	4 2.8	1.68	5.1
23	14 47.3	14 47.9	54 10.2	+ 0.10	54 12.6	+ 0.30	4 42.9	1.66	6.1
24	14 49.3	14 51.3	54 17.6	0.51	54 25.1	0.73	5 23.0	1.69	7.1
25	14 54.0	14 57.5	54 35.1	+ 0.94	54 47.6	+ 1.15	6 4.2	1.76	8.1
26	15 1.5	15 6.2	55 2.6	1.34	55 19.9	1.53	6 47.7	1.87	9.1
27	15 11.5	15 17.3	55 39.3	1.70	56 0.6	1.84	7 34.4	2.02	10.1
28	15 23.6	15 30.2	56 23.6	+ 1.96	56 47.7	+ 2.05	8 25.0	2.20	11.1
29	15 37.0	15 43.9	57 12.7	2.10	57 38.1	2.11	9 19.7	2.36	12.1
30	15 50.8	15 57.5	58 3.4	2.08	58 28.0	2.00	10 18.0	2.48	13.1
31	16 3.8	16 9.7	58 51.4	1.88	59 13.0	1.71	11 18.1	2.52	14.1
32	16 15.0	16 19.5	59 32.4	+ 1.50	59 49.0	+ 1.28	12 18.0	2.47	15.1

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	THURSDAY 1.					SATURDAY 3.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	16 50 23.05	2.3097	S. 22 14 24.3	6.859	0	18 47 26.00	2.5343	S. 25 9 18.0	−0.045
1	16 52 41.82	2.3160	22 21 12.4	6.743	1	18 49 58.13	2.5365	25 9 15.8	+0.117
2	16 55 0.97	2.3222	22 27 53.4	6.625	2	18 52 30.38	2.5384	25 9 3.9	0.280
3	16 57 20.49	2.3284	22 34 27.4	6.507	3	18 55 2.74	2.5403	25 8 42.2	0.443
4	16 59 40.38	2.3346	22 40 54.3	6.388	4	18 57 35.22	2.5422	25 8 10.7	0.606
5	17 2 0.64	2.3407	22 47 14.0	6.267	5	19 0 7.80	2.5438	25 7 29.5	0.769
6	17 4 21.26	2.3468	22 53 26.4	6.145	6	19 2 40.47	2.5453	25 6 38.4	0.933
7	17 6 42.26	2.3530	22 59 31.4	6.022	7	19 5 13.23	2.5467	25 5 37.5	1.097
8	17 9 3.62	2.3589	23 5 29.0	5.897	8	19 7 46.07	2.5479	25 4 26.7	1.262
9	17 11 25.33	2.3648	23 11 19.1	5.772	9	19 10 18.98	2.5490	25 3 6.1	1.426
10	17 13 47.40	2.3707	23 17 1.6	5.645	10	19 12 51.95	2.5500	25 1 35.6	1.591
11	17 16 9.82	2.3767	23 22 36.5	5.517	11	19 15 24.98	2.5508	24 59 55.2	1.755
12	17 18 32.60	2.3825	23 28 3.6	5.387	12	19 17 58.05	2.5515	24 58 5.0	1.919
13	17 20 55.72	2.3882	23 33 22.9	5.256	13	19 20 31.16	2.5521	24 56 4.9	2.084
14	17 23 19.19	2.3939	23 38 34.3	5.123	14	19 23 4.30	2.5525	24 53 54.9	2.249
15	17 25 42.99	2.3995	23 43 37.7	4.990	15	19 25 37.46	2.5527	24 51 35.0	2.414
16	17 28 7.13	2.4051	23 48 33.1	4.856	16	19 28 10.63	2.5529	24 49 5.2	2.579
17	17 30 31.60	2.4106	23 53 20.4	4.721	17	19 30 43.81	2.5529	24 46 25.5	2.743
18	17 32 56.40	2.4160	23 57 59.6	4.584	18	19 33 16.98	2.5528	24 43 36.0	2.907
19	17 35 21.52	2.4213	24 2 30.5	4.446	19	19 35 50.15	2.5527	24 40 36.7	3.071
20	17 37 46.96	2.4266	24 6 53.1	4.307	20	19 38 23.30	2.5523	24 37 27.5	3.236
21	17 40 12.71	2.4317	24 11 7.3	4.167	21	19 40 56.43	2.5518	24 34 8.4	3.399
22	17 42 38.77	2.4369	24 15 13.2	4.027	22	19 43 29.52	2.5512	24 30 39.6	3.562
23	17 45 5.14	2.4419	S. 24 19 10.6	3.885	23	19 46 2.57	2.5504	S. 24 27 0.9	3.726
	FRIDAY 2.					SUNDAY 4.			
0	17 47 31.80	2.4468	S. 24 22 59.4	3.741	0	19 48 35.57	2.5495	S. 24 23 12.5	3.888
1	17 49 58.76	2.4517	24 26 39.5	3.597	1	19 51 8.51	2.5485	24 19 14.3	4.052
2	17 52 26.01	2.4565	24 30 11.0	3.452	2	19 53 41.39	2.5474	24 15 6.3	4.214
3	17 54 53.54	2.4611	24 33 33.8	3.306	3	19 56 14.20	2.5462	24 10 48.6	4.376
4	17 57 21.34	2.4657	24 36 47.7	3.157	4	19 58 46.93	2.5448	24 6 21.2	4.537
5	17 59 49.42	2.4702	24 39 52.7	3.010	5	20 1 19.58	2.5433	24 1 44.2	4.697
6	18 2 17.76	2.4745	24 42 48.8	2.861	6	20 3 52.13	2.5417	23 56 57.5	4.857
7	18 4 46.36	2.4788	24 45 36.0	2.711	7	20 6 24.58	2.5400	23 52 1.3	5.017
8	18 7 15.22	2.4831	24 48 14.2	2.560	8	20 8 56.93	2.5382	23 46 55.5	5.177
9	18 9 44.33	2.4871	24 50 43.3	2.408	9	20 11 29.17	2.5362	23 41 40.1	5.335
10	18 12 13.67	2.4910	24 53 3.2	2.256	10	20 14 1.29	2.5342	23 36 15.3	5.492
11	18 14 43.25	2.4949	24 55 13.9	2.102	11	20 16 33.28	2.5321	23 30 41.0	5.650
12	18 17 13.06	2.4987	24 57 15.4	1.947	12	20 19 5.13	2.5297	23 24 57.3	5.807
13	18 19 43.09	2.5023	24 59 7.6	1.792	13	20 21 36.84	2.5273	23 19 4.2	5.962
14	18 22 13.34	2.5058	25 0 50.5	1.637	14	20 24 8.41	2.5249	23 13 1.8	6.117
15	18 24 43.79	2.5092	25 2 24.1	1.481	15	20 26 39.83	2.5223	23 6 50.1	6.272
16	18 27 14.44	2.5125	25 3 48.2	1.323	16	20 29 11.09	2.5197	23 0 29.2	6.424
17	18 29 45.29	2.5157	25 5 2.9	1.166	17	20 31 42.19	2.5169	22 53 59.2	6.577
18	18 32 16.32	2.5187	25 6 8.1	1.007	18	20 34 13.12	2.5140	22 47 20.0	6.729
19	18 34 47.53	2.5216	25 7 3.7	0.847	19	20 36 43.87	2.5111	22 40 31.7	6.880
20	18 37 18.91	2.5244	25 7 49.8	0.688	20	20 39 14.45	2.5081	22 33 34.4	7.030
21	18 39 50.46	2.5271	25 8 26.3	0.528	21	20 41 44.84	2.5049	22 26 28.1	7.178
22	18 42 22.16	2.5296	25 8 53.2	0.367	22	20 44 15.04	2.5017	22 19 13.0	7.326
23	18 44 54.01	2.5320	25 9 10.5	0.207	23	20 46 45.04	2.4984	22 11 49.0	7.472
24	18 47 26.00	2.5343	S. 25 9 18.0	−0.045	24	20 49 14.84	2.4949	S. 22 4 16.3	7.618

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	MONDAY 5.					WEDNESDAY 7.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	20 49 14.84	2.4949	S. 22 4 16.3	7.618	0	22 44 13.35	2.2896	S. 13 34 27.6	13.079
1	20 51 44.43	2.4915	21 56 34.8	7.764	1	22 46 30.60	2.2853	13 21 20.5	13.157
2	20 54 13.82	2.4880	21 48 44.6	7.907	2	22 48 47.59	2.2812	13 8 8.7	13.233
3	20 56 42.99	2.4843	21 40 45.9	8.050	3	22 51 4.34	2.2771	12 54 52.5	13.307
4	20 59 11.94	2.4807	21 32 38.6	8.192	4	22 53 20.84	2.2730	12 41 31.9	13.380
5	21 1 40.67	2.4770	21 24 22.9	8.332	5	22 55 37.10	2.2689	12 28 6.9	13.452
6	21 4 9.18	2.4732	21 15 58.8	8.471	6	22 57 53.11	2.2649	12 14 37.6	13.522
7	21 6 37.45	2.4692	21 7 26.4	8.609	7	23 0 8.89	2.2610	12 1 4.3	13.589
8	21 9 5.49	2.4654	20 58 45.7	8.746	8	23 2 24.43	2.2571	11 47 26.9	13.657
9	21 11 33.30	2.4615	20 49 56.9	8.881	9	23 4 39.74	2.2532	11 33 45.5	13.723
10	21 14 0.87	2.4574	20 41 0.0	9.016	10	23 6 54.81	2.2493	11 20 0.2	13.786
11	21 16 28.19	2.4532	20 31 55.0	9.149	11	23 9 9.66	2.2457	11 6 11.2	13.847
12	21 18 55.26	2.4491	20 22 42.1	9.281	12	23 11 24.29	2.2419	10 52 18.5	13.908
13	21 21 22.08	2.4449	20 13 21.3	9.411	13	23 13 38.69	2.2382	10 38 22.2	13.967
14	21 23 48.65	2.4407	20 3 52.8	9.540	14	23 15 52.88	2.2347	10 24 22.5	14.024
15	21 26 14.97	2.4365	19 54 16.5	9.668	15	23 18 6.85	2.2311	10 10 19.3	14.081
16	21 28 41.03	2.4322	19 44 32.6	9.795	16	23 20 20.61	2.2276	9 56 12.8	14.135
17	21 31 6.84	2.4279	19 34 41.1	9.920	17	23 22 34.16	2.2242	9 42 3.1	14.187
18	21 33 32.38	2.4235	19 24 42.2	10.043	18	23 24 47.51	2.2207	9 27 50.3	14.239
19	21 35 57.66	2.4191	19 14 35.9	10.167	19	23 27 0.65	2.2174	9 13 34.4	14.289
20	21 38 22.67	2.4147	19 4 22.2	10.288	20	23 29 13.60	2.2142	8 59 15.6	14.337
21	21 40 47.42	2.4102	18 54 1.3	10.407	21	23 31 26.35	2.2109	8 44 53.9	14.384
22	21 43 11.90	2.4057	18 43 33.3	10.525	22	23 33 38.91	2.2077	8 30 29.5	14.429
23	21 45 36.11	2.4012	S. 18 32 58.3	10.642	23	23 35 51.28	2.2047	S. 8 16 2.4	14.473
	TUESDAY 6.					THURSDAY 8.			
0	21 48 0.05	2.3967	S. 18 22 16.2	10.758	0	23 38 3.47	2.2017	S. 8 1 32.7	14.516
1	21 50 23.72	2.3922	18 11 27.3	10.872	1	23 40 15.48	2.1987	7 47 0.5	14.556
2	21 52 47.12	2.3877	18 0 31.6	10.985	2	23 42 27.32	2.1958	7 32 26.0	14.595
3	21 55 10.25	2.3832	17 49 29.2	11.096	3	23 44 38.98	2.1930	7 17 49.1	14.633
4	21 57 33.11	2.3787	17 38 20.1	11.205	4	23 46 50.48	2.1902	7 3 10.0	14.670
5	21 59 55.69	2.3742	17 27 4.5	11.313	5	23 49 1.81	2.1875	6 48 28.7	14.705
6	22 2 18.00	2.3695	17 15 42.5	11.420	6	23 51 12.98	2.1848	6 33 45.4	14.737
7	22 4 40.03	2.3649	17 4 14.1	11.526	7	23 53 23.99	2.1822	6 19 0.2	14.769
8	22 7 1.79	2.3604	16 52 39.4	11.629	8	23 55 34.85	2.1798	6 4 13.1	14.800
9	22 9 23.28	2.3558	16 40 58.6	11.731	9	23 57 45.57	2.1774	5 49 24.2	14.829
10	22 11 44.49	2.3512	16 29 11.7	11.832	10	23 59 56.14	2.1750	5 34 33.6	14.857
11	22 14 5.43	2.3467	16 17 18.8	11.931	11	0 2 6.57	2.1727	5 19 41.4	14.882
12	22 16 26.10	2.3422	16 5 20.0	12.028	12	0 4 16.87	2.1706	5 4 47.7	14.907
13	22 18 46.50	2.3377	15 53 15.4	12.124	13	0 6 27.04	2.1684	4 49 52.6	14.930
14	22 21 6.63	2.3332	15 41 5.1	12.219	14	0 8 37.08	2.1663	4 34 56.1	14.952
15	22 23 26.49	2.3287	15 28 49.1	12.312	15	0 10 47.00	2.1643	4 19 58.4	14.972
16	22 25 46.08	2.3243	15 16 27.6	12.403	16	0 12 56.80	2.1624	4 4 59.5	14.991
17	22 28 5.41	2.3199	15 4 0.7	12.493	17	0 15 6.49	2.1606	3 49 59.5	15.007
18	22 30 24.47	2.3155	14 51 28.4	12.582	18	0 17 16.07	2.1588	3 34 58.6	15.023
19	22 32 43.27	2.3111	14 38 50.9	12.668	19	0 19 25.55	2.1572	3 19 56.7	15.038
20	22 35 1.81	2.3067	14 26 8.2	12.754	20	0 21 34.93	2.1555	3 4 54.0	15.051
21	22 37 20.08	2.3024	14 13 20.4	12.837	21	0 23 44.21	2.1539	2 49 50.6	15.062
22	22 39 38.09	2.2981	14 0 27.6	12.920	22	0 25 53.40	2.1524	2 34 46.5	15.073
23	22 41 55.85	2.2938	13 47 30.0	13.001	23	0 28 2.50	2.1510	2 19 41.8	15.082
24	22 44 13.35	2.2896	S. 13 34 27.6	13.079	24	0 30 11.52	2.1497	S. 2 4 36.6	15.090

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	FRIDAY 9.					SUNDAY 11.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	0 30 11.52	2.1497	S. 2 4 36.6	15.090	0	2 13 14.83	2.1715	N. 9 42 16.6	13.852
1	0 32 20.46	2.1484	1 49 31.0	15.095	1	2 15 25.18	2.1736	9 56 6.0	13.795
2	0 34 29.33	2.1472	1 34 25.2	15.099	2	2 17 35.66	2.1757	10 9 52.0	13.736
3	0 36 38.13	2.1462	1 19 19.1	15.103	3	2 19 46.27	2.1779	10 23 34.3	13.675
4	0 38 46.87	2.1452	1 4 12.8	15.105	4	2 21 57.01	2.1802	10 37 13.0	13.613
5	0 40 55.55	2.1442	0 49 6.5	15.105	5	2 24 7.89	2.1825	10 50 47.9	13.550
6	0 43 4.17	2.1432	0 34 0.2	15.104	6	2 26 18.91	2.1849	11 4 19.0	13.487
7	0 45 12.74	2.1425	0 18 54.0	15.102	7	2 28 30.08	2.1873	11 17 46.3	13.421
8	0 47 21.27	2.1417	S. 0 3 48.0	15.098	8	2 30 41.39	2.1897	11 31 9.5	13.353
9	0 49 29.75	2.1410	N. 0 11 17.8	15.093	9	2 32 52.85	2.1923	11 44 28.7	13.286
10	0 51 38.19	2.1405	0 26 23.2	15 087	10	2 35 4.47	2.1949	11 57 43.8	13.217
11	0 53 46.61	2.1400	0 41 28.2	15.079	11	2 37 16.24	2.1974	12 10 54.7	13.146
12	0 55 54.99	2.1395	0 56 32.7	15 070	12	2 39 28.16	2.2001	12 24 1.3	13.074
13	0 58 3.35	2.1392	1 11 36 6	15.059	13	2 41 40.24	2.2028	12 37 3.6	13.001
14	1 0 11.69	2.1389	1 26 39.8	15.047	14	2 43 52.49	2.2055	12 50 1.4	12.926
15	1 2 20.02	2.1387	1 41 42.3	15 034	15	2 46 4.91	2.2083	13 2 54.7	12.851
16	1 4 28.33	2.1385	1 56 44.0	15 020	16	2 48 17.50	2.2112	13 15 43.5	12.774
17	1 6 36.64	2.1385	2 11 44.7	15.004	17	2 50 30.26	2.2141	13 28 27.6	12.696
18	1 8 44.95	2.1385	2 26 44.4	14.986	18	2 52 43.19	2.2169	13 41 7.0	12.617
19	1 10 53.26	2.1386	2 41 43.0	14.967	19	2 54 56.29	2.2198	13 53 41.6	12.536
20	1 13 1 58	2 1387	2 56 40.5	14.947	20	2 57 9.57	2.2229	14 6 11.3	12.454
21	1 15 9.91	2.1390	3 11 36.8	14.927	21	2 59 23.04	2.2260	14 18 36.1	12.371
22	1 17 18.26	2 1393	3 26 31.7	14.904	22	3 1 36.69	2.2290	14 30 55.8	12.287
23	1 19 26.63	2.1397	N. 3 41 25.2	14.879	23	3 3 50.52	2.2320	N. 14 43 10.5	12.202
	SATURDAY 10.					MONDAY 12.			
0	1 21 35.02	2.1401	N. 3 56 17.2	14.854	0	3 6 4.53	2.2351	N. 14 55 20.0	12.115
1	1 23 43.44	2.1406	4 11 7.7	14.827	1	3 8 18.73	2.2382	15 7 24.3	12.027
2	1 25 51.89	2.1412	4 25 56.5	14.799	2	3 10 33.12	2.2414	15 19 23.2	11.937
3	1 28 0.38	2.1419	4 40 43.6	14.770	3	3 12 47.70	2.2446	15 31 16.7	11.847
4	1 30 8.92	2.1427	4 55 28.9	14.739	4	3 15 2.47	2.2478	15 43 4.8	11.756
5	1 32 17.51	2.1435	5 10 12.3	14.707	5	3 17 17.44	2.2511	15 54 47.4	11.663
6	1 34 26.15	2.1443	5 24 53.8	14.675	6	3 19 32.60	2.2543	16 6 24.4	11.569
7	1 36 34.84	2.1452	5 39 33.3	14.640	7	3 21 47.96	2.2576	16 17 55.7	11.473
8	1 38 43.58	2.1462	5 54 10.6	14.603	8	3 24 3.51	2.2608	16 29 21.2	11.377
9	1 40 52.39	2.1474	6 8 45.7	14.567	9	3 26 19.26	2.2642	16 40 41.0	11.280
10	1 43 1.27	2.1486	6 23 18.6	14.528	10	3 28 35.21	2.2674	16 51 54.8	11.181
11	1 45 10.22	2.1498	6 37 49.1	14.488	11	3 30 51.35	2 2707	17 3 2.7	11.082
12	1 47 19.25	2.1511	6 52 17.2	14.447	12	3 33 7.70	2.2742	17 14 4.6	10.981
13	1 49 28 35	2.1524	7 6 42.8	14.405	13	3 35 24.25	2 2775	17 25 0.4	10.878
14	1 51 37.54	2.1539	7 21 5.8	14.361	14	3 37 41.00	2.2808	17 35 50.0	10.775
15	1 53 46.82	2.1553	7 35 26.1	14.316	15	3 39 57.95	2.2842	17 46 33.4	10.671
16	1 55 56.18	2.1568	7 49 43 7	14.270	16	3 42 15.10	2.2876	17 57 10.5	10.565
17	1 58 5.64	2.1585	8 3 58.5	14.222	17	3 44 32.46	2.2909	18 7 41.2	10.458
18	2 0 15.20	2.1602	8 18 10.4	14.173	18	3 46 50.02	2.2943	18 18 5 5	10.351
19	2 2 24.86	2.1619	8 32 19.3	14.123	19	3 49 7.78	2 2977	18 28 23.3	10.242
20	2 4 34.63	2.1637	8 46 25.2	14.072	20	3 51 25 74	2.3010	18 38 34.6	10.132
21	2 6 44.51	2.1656	9 0 27.9	14.018	21	3 53 43.90	2.3044	18 48 39.2	10.021
22	2 8 54.50	2.1674	9 14 27.4	13.965	22	3 56 2.27	2 3078	18 58 37.1	9.909
23	2 11 4.60	2.1694	9 28 23.7	13.910	23	3 58 20.84	2.3111	19 8 28.3	9.796
24	2 13 14.83	2.1715	N. 9 42 16.6	13.852	24	4 0 39.60	2.3143	N. 19 18 12.6	9.681

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	TUESDAY 13.					THURSDAY 15.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	4 0 39.60	2.3143	N.19 18 12.6	9.681	0	5 54 51.56	2.4204	N.24 34 16.3	3.222
1	4 2 58.56	2.3177	19 27 50.0	9.566	1	5 57 16.80	2.4208	24 37 25.2	3.074
2	4 5 17.72	2.3210	19 37 20.5	9.450	2	5 59 42.06	2.4211	24 40 25.2	2.927
3	4 7 37.08	2.3242	19 46 44.0	9.332	3	6 2 7.33	2.4212	24 43 16.4	2.779
4	4 9 56.63	2.3275	19 56 0.4	9.213	4	6 4 32.61	2.4213	24 45 58.7	2.631
5	4 12 16.38	2.3307	20 5 9.6	9.094	5	6 6 57.89	2.4213	24 48 32.1	2.482
6	4 14 36.32	2.3339	20 14 11.7	8.974	6	6 9 23.17	2.4212	24 50 56.6	2.334
7	4 16 56.45	2.3371	20 23 6.5	8.852	7	6 11 48.43	2.4209	24 53 12.2	2.187
8	4 19 16.77	2.3402	20 31 54.0	8.730	8	6 14 13.68	2.4207	24 55 19.0	2.038
9	4 21 37.28	2.3434	20 40 34.1	8.607	9	6 16 38.91	2.4203	24 57 16.9	1.890
10	4 23 57.98	2.3465	20 49 6.8	8.482	10	6 19 4.11	2.4197	24 59 5.8	1.742
11	4 26 18.86	2.3495	20 57 32.0	8.357	11	6 21 29.28	2.4191	25 0 45.8	1.593
12	4 28 39.92	2.3525	21 5 49.7	8.232	12	6 23 54.40	2.4183	25 2 17.0	1.446
13	4 31 1.16	2.3555	21 13 59.8	8.104	13	6 26 19.48	2 4175	25 3 39.3	1.297
14	4 33 22.58	2.3584	21 22 2.2	7.976	14	6 28 44.50	2.4166	25 4 52.7	1.149
15	4 35 44.17	2.3613	21 29 56.9	7.847	15	6 31 9.47	2.4156	25 5 57.2	1.002
16	4 38 5.94	2.3642	21 37 43.9	7.718	16	6 33 34.37	2.4143	25 6 52.9	0.854
17	4 40 27.87	2.3669	21 45 23.1	7.587	17	6 35 59.19	2.4131	25 7 39.7	0.707
18	4 42 49.97	2.3697	21 52 54.4	7.456	18	6 38 23.94	2.4118	25 8 17.7	0.559
19	4 45 12.23	2.3724	22 0 17.8	7.324	19	6 40 48.61	2.4104	25 8 46.8	0.412
20	4 47 34.66	2.3751	22 7 33.3	7.192	20	6 43 13.19	2.4088	25 9 7.1	0.266
21	4 49 57.24	2.3776	22 14 40.8	7.058	21	6 45 37.67	2.4071	25 9 18.7	+0.119
22	4 52 19.97	2.3801	22 21 40.3	6.923	22	6 48 2.04	2.4053	25 9 21.4	−0.027
23	4 54 42.85	2.3827	N.22 28 31.6	6.787	23	6 50 26.31	2.4036	N.25 9 15.4	0.172
	WEDNESDAY 14.					FRIDAY 16.			
0	4 57 5.89	2.3852	N.22 35 14.8	6.652	0	6 52 50.47	2.4017	N.25 9 0.7	0.318
1	4 59 29.07	2.3874	22 41 49.9	6.516	1	6 55 14.51	2.3996	25 8 37.2	0.463
2	5 1 52.38	2.3897	22 48 16.7	6.377	2	6 57 38.42	2.3973	25 8 5.1	0.607
3	5 4 15.83	2.3920	22 54 35.2	6.240	3	7 0 2.19	2.3951	25 7 24.3	0.752
4	5 6 39.42	2.3942	23 0 45.5	6.102	4	7 2 25.83	2.3928	25 6 34.8	0.897
5	5 9 3.13	2.3962	23 6 47.4	5.962	5	7 4 49.33	2.3904	25 5 36.7	1.039
6	5 11 26.96	2.3982	23 12 41.0	5.822	6	7 7 12.68	2.3878	25 4 30.1	1.182
7	5 13 50.91	2.4001	23 18 26.1	5.681	7	7 9 35.87	2.3852	25 3 14.9	1.324
8	5 16 14.97	2.4020	23 24 2.7	5.540	8	7 11 58.90	2.3824	25 1 51.2	1.467
9	5 18 39.15	2.4038	23 29 30.9	5.399	9	7 14 21.76	2.3796	25 0 18.9	1.608
10	5 21 3.43	2.4055	23 34 50.6	5.257	10	7 16 44.45	2.3767	24 58 38.2	1.748
11	5 23 27.81	2.4071	23 40 1.7	5.113	11	7 19 6.97	2.3737	24 56 49.1	1.888
12	5 25 52.28	2.4087	23 45 4.2	4.970	12	7 21 29.30	2.3706	24 54 51.6	2.028
13	5 28 16.85	2.4102	23 49 58.1	4.827	13	7 23 51.44	2.3674	24 52 45.7	2.167
14	5 30 41.50	2.4115	23 54 43.4	4.682	14	7 26 13.39	2.3642	24 50 31.5	2.305
15	5 33 6.23	2.4128	23 59 20.0	4.538	15	7 28 35.15	2.3609	24 48 9.1	2.442
16	5 35 31.04	2.4141	24 3 48.0	4.393	16	7 30 56.70	2.3575	24 45 38.4	2.580
17	5 37 55.92	2.4152	24 8 7.2	4.247	17	7 33 18.05	2.3540	24 42 59.5	2.716
18	5 40 20.86	2.4162	24 12 17.7	4.102	18	7 35 39.18	2.3503	24 40 12.5	2.852
19	5 42 45.86	2.4171	24 16 19.4	3.956	19	7 38 0.09	2.3467	24 37 17.3	2.987
20	5 45 10.91	2.4179	24 20 12.4	3.810	20	7 40 20.78	2.3430	24 34 14.1	3.120
21	5 47 36.01	2.4187	24 23 56.6	3.663	21	7 42 41.25	2.3392	24 31 2.9	3.253
22	5 50 1.16	2.4195	24 27 32.0	3.517	22	7 45 1.48	2.3352	24 27 43.7	3.387
23	5 52 26.35	2.4200	24 30 58.6	3.369	23	7 47 21.48	2.3313	24 24 16.5	3.518
24	5 54 51.56	2.4204	N.24 34 16.3	3.222	24	7 49 41.24	2.3272	N.24 20 41.5	3.649

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute
	SATURDAY 17.					MONDAY 19.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	7 49 41.24	2.3472	N.24 20 41.5	3.649	0	9 35 50.42	2.0862	N.19 12 32.3	8.799
1	7 52 0.75	2.3232	24 16 58.6	3.779	1	9 37 55.44	2.0810	19 3 41.9	8.880
2	7 54 20.02	2.3190	24 13 8.0	3.907	2	9 40 0.14	2.0757	18 54 46.7	8.961
3	7 56 39.03	2.3147	24 9 9.7	4.036	3	9 42 4.53	2.0705	18 45 46.6	9.041
4	7 58 57.78	2.3104	24 5 3.7	4.164	4	9 44 8.60	2.0653	18 36 41.8	9.118
5	8 1 16.27	2.3061	24 0 50.0	4.292	5	9 46 12.37	2.0602	18 27 32.4	9.196
6	8 3 34.50	2.3016	23 56 28.7	4.417	6	9 48 15.82	2.0549	18 18 18.3	9.273
7	8 5 52.47	2.2972	23 51 59.9	4.542	7	9 50 18.96	2.0498	18 8 59.6	9.348
8	8 8 10.17	2.2927	23 47 23.7	4.666	8	9 52 21.80	2.0447	17 59 36.5	9.422
9	8 10 27.59	2.2880	23 42 40.0	4.789	9	9 54 24.33	2.0396	17 50 8.9	9.497
10	8 12 44.73	2.2833	23 37 49.0	4.911	10	9 56 26.55	2.0345	17 40 36.9	9.569
11	8 15 1.59	2.2787	23 32 50.7	5.032	11	9 58 28.47	2.0295	17 31 0.6	9.640
12	8 17 18.17	2.2739	23 27 45.1	5.152	12	10 0 30.09	2.0245	17 21 20.1	9.710
13	8 19 34.46	2.2692	23 22 32.4	5.272	13	10 2 31.41	2.0195	17 11 35.4	9.779
14	8 21 50.47	2.2643	23 17 12.5	5.391	14	10 4 32.43	2.0146	17 1 46.6	9.847
15	8 24 6.18	2.2594	23 11 45.5	5.508	15	10 6 33.16	2.0097	16 51 53.7	9.916
16	8 26 21.60	2.2545	23 6 11.5	5.624	16	10 8 33.59	2.0047	16 41 56.7	9.982
17	8 28 36.72	2.2496	23 0 30.6	5.739	17	10 10 33.73	1.9999	16 31 55.8	10.047
18	8 30 51.55	2.2446	22 54 42.8	5.854	18	10 12 33.58	1.9952	16 21 51.1	10.111
19	8 33 6.07	2.2395	22 48 48.1	5.967	19	10 14 33.15	1.9904	16 11 42.5	10.175
20	8 35 20.29	2.2344	22 42 46.7	6.079	20	10 16 32.43	1.9856	16 1 30.1	10.237
21	8 37 34.20	2.2293	22 36 38.6	6.191	21	10 18 31.42	1.9809	15 51 14.0	10.299
22	8 39 47.81	2.2242	22 30 23.8	6.302	22	10 20 30.14	1.9763	15 40 54.2	10.360
23	8 42 1.11	2.2191	N.22 24 2.4	6.411	23	10 22 28.58	1.9717	N.15 30 30.8	10.419
	SUNDAY 18.					TUESDAY 20.			
0	8 44 14.10	2.2139	N.22 17 34.5	6.519	0	10 24 26.74	1.9671	N.15 20 3.9	10.477
1	8 46 26.78	2.2087	22 11 0.1	6.626	1	10 26 24.63	1.9626	15 9 33.5	10.535
2	8 48 39.14	2.2034	22 4 19.4	6.732	2	10 28 22.25	1.9581	14 58 59.7	10.592
3	8 50 51.19	2.1982	21 57 32.3	6.837	3	10 30 19.60	1.9536	14 48 22.5	10.647
4	8 53 2.92	2.1929	21 50 39.0	6.941	4	10 32 16.68	1.9492	14 37 42.0	10.702
5	8 55 14.34	2.1877	21 43 39.4	7.044	5	10 34 13.50	1.9449	14 26 58.2	10.757
6	8 57 25.44	2.1823	21 36 33.7	7.146	6	10 36 10.07	1.9407	14 16 11.2	10.809
7	8 59 36.22	2.1770	21 29 21.9	7.247	7	10 38 6.38	1.9363	14 5 21.1	10.862
8	9 1 46.68	2.1717	21 22 4.1	7.347	8	10 40 2.43	1.9321	13 54 27.8	10.913
9	9 3 56.82	2.1664	21 14 40.3	7.446	9	10 41 58.23	1.9279	13 43 31.5	10.963
10	9 6 6.65	2.1611	21 7 10.6	7.543	10	10 43 53.78	1.9238	13 32 32.2	11.012
11	9 8 16.15	2.1557	20 59 35.1	7.640	11	10 45 49.09	1.9198	13 21 30.0	11.061
12	9 10 25.33	2.1503	20 51 53.8	7.736	12	10 47 44.16	1.9158	13 10 24.9	11.109
13	9 12 34.19	2.1449	20 44 6.8	7.830	13	10 49 38.99	1.9118	12 59 16.9	11.156
14	9 14 42.72	2.1395	20 36 14.2	7.922	14	10 51 33.58	1.9079	12 48 6.2	11.202
15	9 16 50.93	2.1342	20 28 16.1	8.015	15	10 53 27.94	1.9041	12 36 52.7	11.247
16	9 18 58.83	2.1289	20 20 12.4	8.107	16	10 55 22.07	1.9002	12 25 36.6	11.291
17	9 21 6.40	2.1235	20 12 3.3	8.197	17	10 57 15.97	1.8965	12 14 17.8	11.335
18	9 23 13.65	2.1181	20 3 48.8	8.286	18	10 59 9.65	1.8928	12 2 56.4	11.377
19	9 25 20.57	2.1127	19 55 29.0	8.374	19	11 1 3.11	1.8892	11 51 32.5	11.419
20	9 27 27.18	2.1075	19 47 3.9	8.462	20	11 2 56.35	1.8856	11 40 6.1	11.460
21	9 29 33.47	2.1022	19 38 33.6	8.547	21	11 4 49.38	1.8821	11 28 37.3	11.500
22	9 31 39.44	2.0968	19 29 58.2	8.632	22	11 6 42.20	1.8787	11 17 6.1	11.539
23	9 33 45.09	2.0915	19 21 17.8	8.716	23	11 8 34.82	1.8752	11 5 32.6	11.577
24	9 35 50.42	2.0862	N.19 12 32.3	8.799	24	11 10 27.23	1.8718	N.10 53 56.8	11.615

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	WEDNESDAY 21.			
	h m s	s	° ′ ″	″
0	11 10 27.23	1.8718	N.10 53 56.8	11.615
1	11 12 19.44	1.8686	10 42 18.8	11.652
2	11 14 11.46	1.8653	10 30 38.5	11.688
3	11 16 3.28	1.8621	10 18 56.2	11.723
4	11 17 54.91	1.8590	10 7 11.7	11.758
5	11 19 46.36	1.8559	9 55 25.2	11.792
6	11 21 37.62	1.8528	9 43 36.7	11.824
7	11 23 28.70	1.8499	9 31 46.3	11.857
8	11 25 19.61	1.8471	9 19 53.9	11.889
9	11 27 10.35	1.8442	9 7 59.6	11.919
10	11 29 0.92	1.8415	8 56 3.6	11.949
11	11 30 51.33	1.8388	8 44 5.7	11.978
12	11 32 41.58	1.8362	8 32 6.2	12.006
13	11 34 31.67	1.8335	8 20 5.0	12.034
14	11 36 21.60	1.8310	8 8 2.1	12.062
15	11 38 11.39	1.8286	7 55 57.6	12.087
16	11 40 1.03	1.8262	7 43 51.6	12.112
17	11 41 50.53	1.8238	7 31 44.1	12.137
18	11 43 39.89	1.8216	7 19 35.1	12.162
19	11 45 29.12	1.8194	7 7 24.6	12.186
20	11 47 18.22	1.8172	6 55 12.8	12.208
21	11 49 7.19	1.8151	6 42 59.6	12.231
22	11 50 56.03	1.8131	6 30 45.1	12.252
23	11 52 44.76	1.8112	N. 6 18 29.4	12.272
	THURSDAY 22.			
0	11 54 33.38	1.8093	N. 6 6 12.4	12.292
1	11 56 21.88	1.8075	5 53 54.3	12.312
2	11 58 10.28	1.8057	5 41 35.0	12.331
3	11 59 58.57	1.8040	5 29 14.6	12.348
4	12 1 46.76	1.8024	5 16 53.2	12.366
5	12 3 34.86	1.8008	5 4 30.7	12.382
6	12 5 22.86	1.7993	4 52 7.3	12.397
7	12 7 10.78	1.7979	4 39 43.0	12.413
8	12 8 58.61	1.7965	4 27 17.7	12.428
9	12 10 46.36	1.7952	4 14 51.6	12.442
10	12 12 34.04	1.7940	4 2 24.6	12.456
11	12 14 21.64	1.7928	3 49 56.9	12.467
12	12 16 9.18	1.7917	3 37 28.5	12.479
13	12 17 56.65	1.7907	3 24 59.4	12.491
14	12 19 44.06	1.7897	3 12 29.6	12.502
15	12 21 31.42	1.7888	2 59 59.1	12.512
16	12 23 18.72	1.7880	2 47 28.1	12.522
17	12 25 5.98	1.7872	2 34 56.5	12.531
18	12 26 53.19	1.7865	2 22 24.4	12.539
19	12 28 40.36	1.7859	2 9 51.8	12.547
20	12 30 27.50	1.7853	1 57 18.8	12.553
21	12 32 14.60	1.7848	1 44 45.4	12.560
22	12 34 1.68	1.7844	1 32 11.6	12.566
23	12 35 48.73	1.7841	1 19 37.5	12.571
24	12 37 35.77	1.7838	N. 1 7 3.1	12.575

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	FRIDAY 23.			
	h m s	s	° ′ ″	″
0	12 37 35.77	1.7838	N. 1 7 3.1	12.575
1	12 39 22.79	1.7836	0 54 28.5	12.579
2	12 41 9.80	1.7834	0 41 53.6	12.582
3	12 42 56.80	1.7833	0 29 18.6	12.585
4	12 44 43.80	1.7833	0 16 43.4	12.587
5	12 46 30.80	1.7833	N. 0 4 8.2	12.588
6	12 48 17.80	1.7834	S. 0 8 27.2	12.590
7	12 50 4.81	1.7837	0 21 2.6	12.589
8	12 51 51.84	1.7839	0 33 37.9	12.588
9	12 53 38.88	1.7842	0 46 13.2	12.588
10	12 55 25.95	1.7847	0 58 48.5	12.587
11	12 57 13.04	1.7851	1 11 23.6	12.584
12	12 59 0.16	1.7857	1 23 58.6	12.582
13	13 0 47.32	1.7862	1 36 33.4	12.577
14	13 2 34.51	1.7869	1 49 7.9	12.572
15	13 4 21.75	1.7877	2 1 42.1	12.568
16	13 6 9.03	1.7884	2 14 16.1	12.563
17	13 7 56.36	1.7893	2 26 49.7	12.557
18	13 9 43.75	1.7903	2 39 22.9	12.550
19	13 11 31.20	1.7913	2 51 55.7	12.543
20	13 13 18.71	1.7924	3 4 28.1	12.536
21	13 15 6.29	1.7936	3 17 0.0	12.527
22	13 16 53.94	1.7948	3 29 31.3	12.517
23	13 18 41.66	1.7961	S. 3 42 2.1	12.507
	SATURDAY 24.			
0	13 20 29.47	1.7975	S. 3 54 32.2	12.497
1	13 22 17.36	1.7989	4 7 1.7	12.486
2	13 24 5.34	1.8004	4 19 30.5	12.474
3	13 25 53.41	1.8020	4 31 58.6	12.462
4	13 27 41.58	1.8037	4 44 26.0	12.449
5	13 29 29.85	1.8053	4 56 52.5	12.435
6	13 31 18.22	1.8071	5 9 18.2	12.421
7	13 33 6.70	1.8090	5 21 43.0	12.406
8	13 34 55.30	1.8109	5 34 6.9	12.391
9	13 36 44.01	1.8129	5 46 29.9	12.374
10	13 38 32.85	1.8151	5 58 51.8	12.357
11	13 40 21.82	1.8172	6 11 12.7	12.340
12	13 42 10.91	1.8194	6 23 32.6	12.322
13	13 44 0.14	1.8217	6 35 51.3	12.302
14	13 45 49.51	1.8240	6 48 8.9	12.282
15	13 47 39.02	1.8263	7 0 25.2	12.262
16	13 49 28.67	1.8288	7 12 40.3	12.242
17	13 51 18.48	1.8315	7 24 54.2	12.220
18	13 53 8.45	1.8341	7 37 6.7	12.197
19	13 54 58.57	1.8368	7 49 17.8	12.173
20	13 56 48.86	1.8396	8 1 27.5	12.150
21	13 58 39.32	1.8424	8 13 35.8	12.126
22	14 0 29.95	1.8452	8 25 42.6	12.101
23	14 2 20.75	1.8482	8 37 47.9	12.075
24	14 4 11.74	1.8513	S. 8 49 51.6	12.047

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	SUNDAY 25.					TUESDAY 27.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	14 4 11.74	1.8513	S. 8 49 51.6	12.047	0	15 37 49.85	2.0738	S. 17 41 48.6	9.766
1	14 6 2.91	1.8544	9 1 53.6	12.020	1	15 39 54.46	2.0798	17 51 32.4	9.694
2	14 7 54.27	1.8577	9 13 54.0	11.992	2	15 41 59.43	2.0858	18 1 11.9	9.621
3	14 9 45.83	1.8609	9 25 52.7	11.963	3	15 44 4.76	2.0919	18 10 46.9	9.547
4	14 11 37.58	1.8642	9 37 49.6	11.933	4	15 46 10.46	2.0981	18 20 17.5	9.472
5	14 13 29.53	1.8676	9 49 44.7	11.902	5	15 48 16.53	2.1042	18 29 43.6	9.396
6	14 15 21.69	1.8711	10 1 37.9	11.872	6	15 50 22.97	2.1105	18 39 5.0	9.318
7	14 17 14.06	1.8746	10 13 29.3	11.840	7	15 52 29.79	2.1167	18 48 21.8	9.240
8	14 19 6.64	1.8782	10 25 18.7	11.807	8	15 54 36.98	2.1231	18 57 33.8	9.160
9	14 20 59.44	1.8818	10 37 6.1	11.773	9	15 56 44.56	2.1294	19 6 41.0	9.079
10	14 22 52.46	1.8856	10 48 51.5	11.739	10	15 58 52.51	2.1357	19 15 43.3	8.997
11	14 24 45.71	1.8894	11 0 34.8	11.703	11	16 1 0.84	2.1421	19 24 40.6	8.915
12	14 26 39.19	1.8932	11 12 15.9	11.667	12	16 3 9.56	2.1485	19 33 32.9	8.829
13	14 28 32.90	1.8972	11 23 54.9	11.630	13	16 5 18.66	2.1549	19 42 20.1	8.743
14	14 30 26.85	1.9012	11 35 31.6	11.592	14	16 7 28.15	2.1614	19 51 2.1	8.657
15	14 32 21.04	1.9052	11 47 6.0	11.554	15	16 9 38.03	2.1679	19 59 38.9	8.568
16	14 34 15.48	1.9094	11 58 38.1	11.515	16	16 11 48.30	2.1744	20 8 10.3	8.478
17	14 36 10.17	1.9136	12 10 7.8	11.475	17	16 13 58.96	2.1810	20 16 36.3	8.387
18	14 38 5.11	1.9178	12 21 35.1	11.434	18	16 16 10.02	2.1876	20 24 56.8	8.296
19	14 40 0.31	1.9222	12 32 59.9	11.392	19	16 18 21.47	2.1941	20 33 11.8	8.203
20	14 41 55.77	1.9266	12 44 22.2	11.349	20	16 20 33.31	2.2007	20 41 21.2	8.108
21	14 43 51.50	1.9310	12 55 41.8	11.306	21	16 22 45.55	2.2073	20 49 24.8	8.012
22	14 45 47.49	1.9355	13 6 58.9	11.262	22	16 24 58.19	2.2139	20 57 22.6	7.915
23	14 47 43.76	1.9402	S. 13 18 13.2	11.216	23	16 27 11.22	2.2205	S. 21 5 14.6	7.817
	MONDAY 26.					WEDNESDAY 28.			
0	14 49 40.31	1.9448	S. 13 29 24.8	11.170	0	16 29 24.65	2.2272	S. 21 13 0.7	7.717
1	14 51 37.14	1.9495	13 40 33.6	11.122	1	16 31 38.48	2.2338	21 20 40.7	7.617
2	14 53 34.25	1.9542	13 51 39.5	11.074	2	16 33 52.71	2.2405	21 28 14.7	7.515
3	14 55 31.65	1.9591	14 2 42.5	11.025	3	16 36 7.34	2.2471	21 35 42.5	7.412
4	14 57 29.34	1.9640	14 13 42.5	10.975	4	16 38 22.36	2.2537	21 43 4.1	7.307
5	14 59 27.33	1.9690	14 24 39.5	10.925	5	16 40 37.79	2.2604	21 50 19.3	7.200
6	15 1 25.62	1.9740	14 35 33.5	10.873	6	16 42 53.61	2.2670	21 57 28.1	7.093
7	15 3 24.21	1.9790	14 46 24.3	10.819	7	16 45 9.83	2.2737	22 4 30.5	6.985
8	15 5 23.10	1.9842	14 57 11.8	10.766	8	16 47 26.45	2.2803	22 11 26.3	6.875
9	15 7 22.31	1.9894	15 7 56.2	10.712	9	16 49 43.47	2.2869	22 18 15.5	6.763
10	15 9 21.83	1.9947	15 18 37.2	10.655	10	16 52 0.88	2.2935	22 24 57.9	6.651
11	15 11 21.67	1.9999	15 29 14.8	10.598	11	16 54 18.69	2.3001	22 31 33.6	6.538
12	15 13 21.82	2.0052	15 39 49.0	10.541	12	16 56 36.89	2.3067	22 38 2.5	6.423
13	15 15 22.30	2.0107	15 50 19.7	10.482	13	16 58 55.49	2.3132	22 44 24.4	6.306
14	15 17 23.11	2.0162	16 0 46.8	10.422	14	17 1 14.47	2.3197	22 50 39.2	6.188
15	15 19 24.24	2.0217	16 11 10.3	10.361	15	17 3 33.85	2.3262	22 56 47.0	6.070
16	15 21 25.71	2.0273	16 21 30.1	10.299	16	17 5 53.62	2.3327	23 2 47.6	5.949
17	15 23 27.52	2.0330	16 31 46.2	10.237	17	17 8 13.77	2.3391	23 8 40.9	5.828
18	15 25 29.67	2.0387	16 41 58.5	10.172	18	17 10 34.31	2.3456	23 14 27.0	5.706
19	15 27 32.16	2.0443	16 52 6.9	10.107	19	17 12 55.24	2.3519	23 20 5.6	5.581
20	15 29 34.99	2.0501	17 2 11.4	10.042	20	17 15 16.54	2.3582	23 25 36.7	5.456
21	15 31 38.17	2.0560	17 12 11.9	9.974	21	17 17 38.22	2.3645	23 31 0.3	5.329
22	15 33 41.71	2.0619	17 22 8.3	9.905	22	17 20 0.28	2.3708	23 36 16.2	5.201
23	15 35 45.60	2.0678	17 32 0.5	9.836	23	17 22 22.72	2.3770	23 41 24.4	5.072
24	15 37 49.85	2.0738	S. 17 41 48.6	9.766	24	17 24 45.52	2.3831	S. 23 46 24.9	4.942

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.			Diff. for 1 Minute.	Declination.			Diff. for 1 Minute.
	THURSDAY 29.							
	h	m	s	s	°	′	″	″
0	17	24	45.52	2.3831	S. 23	46	24.9	4.942
1	17	27	8.69	2.3892	23	51	17.5	4.811
2	17	29	32.22	2.3952	23	56	2.2	4.678
3	17	31	56.12	2.4012	24	0	38.9	4.544
4	17	34	20.37	2.4072	24	5	7.5	4.409
5	17	36	44.98	2.4131	24	9	28.0	4.272
6	17	39	9.94	2.4188	24	13	40.2	4.135
7	17	41	35.24	2.4245	24	17	44.2	3.997
8	17	44	0.88	2.4302	24	21	39.8	3.857
9	17	46	26.86	2.4359	24	25	27.0	3.715
10	17	48	53.18	2.4413	24	29	5.6	3.572
11	17	51	19.83	2.4467	24	32	35.7	3.430
12	17	53	46.80	2.4522	24	35	57.2	3.286
13	17	56	14.09	2.4575	24	39	10.0	3.140
14	17	58	41.70	2.4627	24	42	14.0	2.993
15	18	1	9.61	2.4677	24	45	9.2	2.845
16	18	3	37.83	2.4728	24	47	55.5	2.697
17	18	6	6.35	2.4777	24	50	32.8	2.547
18	18	8	35.16	2.4826	24	53	1.1	2.396
19	18	11	4.26	2.4873	24	55	20.3	2.244
20	18	13	33.64	2.4919	24	57	30.4	2.092
21	18	16	3.30	2.4965	24	59	31.4	1.939
22	18	18	33.23	2.5010	25	1	23.1	1.784
23	18	21	3.42	2.5052	S. 25	3	5.5	1.628
	FRIDAY 30.							
0	18	23	33.86	2.5095	S. 25	4	38.5	1.472
1	18	26	4.55	2.5137	25	6	2.2	1.316
2	18	28	35.49	2.5176	25	7	16.4	1.157
3	18	31	6.67	2.5215	25	8	21.1	0.998
4	18	33	38.08	2.5253	25	9	16.3	0.839
5	18	36	9.71	2.5290	25	10	1.9	0.679
6	18	38	41.55	2.5325	25	10	37.8	0.518
7	18	41	13.60	2.5359	25	11	4.0	0.357
8	18	43	45.86	2.5393	25	11	20.5	0.194
9	18	46	18.32	2.5425	25	11	27.3	−0.032
10	18	48	50.96	2.5455	25	11	24.3	+0.132
11	18	51	23.78	2.5484	25	11	11.4	0.297
12	18	53	56.77	2.5512	25	10	48.7	0.461
13	18	56	29.93	2.5539	25	10	16.1	0.626
14	18	59	3.24	2.5564	25	9	33.6	0.792
15	19	1	36.70	2.5588	25	8	41.1	0.958
16	19	4	10.30	2.5611	25	7	38.6	1.125
17	19	6	44.03	2.5632	25	6	26.1	1.292
18	19	9	17.89	2.5653	25	5	3.6	1.458
19	19	11	51.87	2.5672	25	3	31.1	1.626
20	19	14	25.95	2.5689	25	1	48.5	1.794
21	19	17	0.14	2.5705	24	59	55.8	1.962
22	19	19	34.42	2.5720	24	57	53.1	2.129
23	19	22	8.78	2.5734	24	55	40.3	2.298
24	19	24	43.22	2.5746	S. 24	53	17.3	2.467

Hour.	Right Ascension.			Diff. for 1 Minute.	Declination.			Diff. for 1 Minute.
	SATURDAY 31.							
	h	m	s	s	°	′	″	″
0	19	24	43.22	2.5746	S. 24	53	17.3	2.467
1	19	27	17.73	2.5757	24	50	44.2	2.637
2	19	29	52.30	2.5766	24	48	0.9	2.805
3	19	32	26.92	2.5773	24	45	7.6	2.973
4	19	35	1.58	2.5780	24	42	4.1	3.142
5	19	37	36.28	2.5785	24	38	50.5	3.312
6	19	40	11.00	2.5788	24	35	26.7	3.480
7	19	42	45.74	2.5791	24	31	52.9	3.648
8	19	45	20.50	2.5793	24	28	8.9	3.817
9	19	47	55.26	2.6793	24	24	14.8	3.985
10	19	50	30.02	2.5792	24	20	10.7	4.153
11	19	53	4.77	2.5789	24	15	56.4	4.322
12	19	55	39.49	2.5785	24	11	32.1	4.489
13	19	58	14.19	2.5780	24	6	57.7	4.657
14	20	0	48.85	2.5772	24	2	13.3	4.823
15	20	3	23.46	2.5764	23	57	18.9	4.990
16	20	5	58.02	2.5756	23	52	14.5	5.157
17	20	8	32.53	2.5746	23	47	0.1	5.322
18	20	11	6.97	2.5734	23	41	35.8	5.487
19	20	13	41.34	2.5721	23	36	1.7	5.652
20	20	16	15.62	2.5707	23	30	17.7	5.816
21	20	18	49.82	2.5692	23	24	23.8	5.979
22	20	21	23.93	2.5676	23	18	20.2	6.142
23	20	23	57.93	2.5658	S. 23	12	6.8	6.304
	SUNDAY, AUGUST 1.							
0	20	26	31.83	2.5639	S. 23	5	43.7	6.466

PHASES OF THE MOON.

			d	h	m
○	Full Moon	July	3	0	17.3
☾	Last Quarter		9	18	58.1
●	New Moon		16	22	44.6
☽	First Quarter		24	23	45.3

			d	h
☾	Perigee	July	7	8.0
☾	Apogee		22	18.3

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	III^{h}	P. L. of Diff.	VI^{h}	P. L. of Diff.	IX^{h}	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
1	Regulus	W.	105 21 42	2631	106 59 55	2618	108 38 26	2604	110 17 16	2590
	JUPITER	W.	94 21 2	2678	95 58 12	2664	97 35 40	2650	99 13 28	2636
	Spica	W.	51 23 34	2659	53 1 10	2643	54 39 6	2627	56 17 24	2611
	α Aquilæ	E.	53 1 10	3990	51 49 21	4041	50 38 23	4098	49 28 20	4162
	Fomalhaut	E.	79 31 7	2796	77 56 34	2784	76 21 45	2773	74 46 41	2762
	MARS	E.	97 7 52	2790	95 33 10	2775	93 58 9	2760	92 22 48	2745
	α Pegasi	E.	97 44 17	3037	96 14 50	3021	94 45 3	3005	93 14 56	2989
2	JUPITER	W.	107 27 5	2569	109 6 44	2556	110 46 40	2543	112 26 54	2531
	Spica	W.	64 34 6	2539	66 14 26	2525	67 55 5	2511	69 36 3	2498
	Fomalhaut	E.	66 47 58	2715	65 11 38	2707	63 35 8	2701	61 58 30	2696
	MARS	E.	84 21 14	2673	82 43 58	2660	81 6 24	2646	79 28 32	2633
	α Pegasi	E.	85 39 51	2924	84 8 2	2914	82 36 1	2905	81 3 48	2896
	SATURN	E.	115 1 24	2527	113 20 49	2514	111 39 55	2501	109 58 43	2488
3	Spica	W.	78 5 23	2436	79 48 6	2425	81 31 5	2414	83 14 20	2403
	Antares	W.	32 15 34	2472	33 57 27	2456	35 39 43	2440	37 22 21	2425
	Fomalhaut	E.	53 53 59	2686	52 16 59	2688	50 40 3	2692	49 3 12	2698
	MARS	E.	71 14 45	2571	69 35 10	2559	67 55 18	2548	66 15 11	2537
	α Pegasi	E.	73 20 19	2868	71 47 19	2866	70 14 16	2866	68 41 14	2867
	SATURN	E.	101 28 22	2429	99 45 28	2417	98 2 18	2406	96 18 52	2396
	α Arietis	E.	115 38 24	2553	113 58 25	2539	112 18 6	2525	110 37 27	2511
4	Spica	W.	91 54 9	2357	93 38 46	2348	95 23 35	2341	97 8 35	2334
	Antares	W.	46 0 16	2365	47 44 41	2356	49 29 19	2346	51 14 12	2337
	MARS	E.	57 50 57	2488	56 9 27	2479	54 27 44	2470	52 45 49	2462
	α Pegasi	E.	60 57 6	2899	59 24 46	2912	57 52 42	2927	56 20 57	2945
	SATURN	E.	87 38 10	2349	85 53 22	2341	84 8 22	2333	82 23 10	2326
	α Arietis	E.	102 9 48	2454	100 27 30	2444	98 44 58	2435	97 2 13	2427
5	Spica	W.	105 56 1	2304	107 41 55	2299	109 27 56	2295	111 14 3	2291
	Antares	W.	60 1 38	2300	61 47 38	2294	63 33 47	2288	65 20 5	2283
	MARS	E.	44 13 39	2429	42 30 45	2424	40 47 44	2419	39 4 36	2414
	SATURN	E.	73 34 38	2293	71 48 28	2288	70 2 11	2283	68 15 47	2279
	α Arietis	E.	88 25 46	2394	86 42 2	2389	84 58 12	2385	83 14 15	2381
	Aldebaran	E.	119 6 51	2294	117 20 43	2289	115 34 27	2284	113 48 3	2279
6	Antares	W.	74 13 10	2264	76 0 2	2262	77 46 58	2260	79 33 57	2258
	α Aquilæ	W.	40 21 46	4772	41 21 45	4590	42 24 18	4426	43 29 16	4279
	MARS	E.	30 27 29	2398	28 43 50	2396	27 0 9	2394	25 16 25	2392
	SATURN	E.	59 22 19	2262	57 35 24	2260	55 48 26	2258	54 1 25	2257
	α Arietis	E.	74 33 32	2373	72 49 18	2373	71 5 5	2374	69 20 53	2376
	Aldebaran	E.	104 54 28	2260	103 7 30	2258	101 20 29	2256	99 33 24	2254
7	Antares	W.	88 29 21	2254	90 16 28	2255	92 3 34	2256	93 50 39	2257
	α Aquilæ	W.	49 24 15	3746	50 40 13	3671	51 57 31	3601	53 16 4	3539
	SATURN	E.	45 5 59	2255	43 18 53	2255	41 31 47	2256	39 44 43	2258
	α Arietis	E.	60 40 48	2395	58 57 6	2402	57 13 34	2409	55 30 12	2418
	Aldebaran	E.	90 37 34	2251	88 50 22	2252	87 3 12	2252	85 16 2	2253
	SUN	E.	127 7 40	2540	125 27 22	2540	123 47 4	2540	122 6 47	2541
8	Antares	W.	102 45 35	2266	104 32 25	2269	106 19 11	2272	108 5 52	2275

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XV^h	P. L. of Diff.	XVIII^h	P. L. of Diff.	XXI^h	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
1	Regulus	W.	111 56 25	2577	113 35 52	2564	115 15 38	2551	116 55 41	2537
	JUPITER	W.	100 51 34	2622	102 29 59	2608	104 8 43	2595	105 47 45	2582
	Spica	W.	57 56 4	2596	59 35 4	2581	61 14 25	2567	62 54 6	2553
	α Aquilæ	E.	48 19 17	4233	47 11 22	4315	46 4 44	4408	44 59 30	4512
	Fomalhaut	E.	73 11 23	2751	71 35 51	2741	70 0 5	2732	68 24 7	2723
	MARS	E.	90 47 8	2730	89 11 8	2716	87 34 49	2701	85 58 11	2687
	α Pegasi	E.	91 44 30	2974	90 13 45	2961	88 42 43	2948	87 11 25	2935
2	JUPITER	W.	114 7 24	2519	115 48 11	2507	117 29 15	2496	119 10 35	2485
	Spica	W.	71 17 20	2485	72 58 55	2472	74 40 47	2460	76 22 57	2448
	Fomalhaut	E.	60 21 45	2692	58 44 54	2689	57 7 58	2687	55 30 59	2685
	MARS	E.	77 50 21	2620	76 11 53	2607	74 33 7	2595	72 54 4	2583
	α Pegasi	E.	79 31 23	2888	77 58 48	2882	76 26 5	2876	74 53 15	2871
	SATURN	E.	108 17 13	2476	106 35 26	2464	104 53 21	2452	103 11 0	2440
3	Spica	W.	84 57 50	2393	86 41 35	2384	88 25 33	2375	90 9 45	2366
	Antares	W.	39 5 20	2412	40 48 38	2400	42 32 13	2387	44 16 6	2375
	Fomalhaut	E.	47 26 30	2707	45 49 59	2718	44 13 43	2732	42 37 45	2748
	MARS	E.	64 24 48	2526	62 54 11	2516	61 13 20	2506	59 32 15	2497
	α Pegasi	E.	67 8 13	2870	65 35 15	2874	64 2 23	2880	62 29 39	2889
	SATURN	E.	94 35 12	2386	92 51 17	2376	91 7 8	2367	89 22 45	2358
	α Arietis	E.	108 56 29	2499	107 15 13	2487	105 33 41	2475	103 51 52	2464
4	Spica	W.	98 53 46	2327	100 39 6	2321	102 24 36	2315	104 10 14	2309
	Antares	W.	52 59 18	2328	54 44 36	2320	56 30 6	2313	58 15 47	2306
	MARS	E.	51 3 43	2455	49 21 26	2448	47 39 0	2441	45 56 24	2435
	α Pegasi	E.	54 49 36	2967	53 18 42	2991	51 48 18	3019	50 18 29	3052
	SATURN	E.	80 37 48	2318	78 52 15	2311	77 6 32	2305	75 20 39	2299
	α Arietis	E.	95 19 16	2419	93 36 8	2412	91 52 50	2405	90 9 22	2399
5	Spica	W.	113 0 16	2288	114 46 34	2285	116 32 55	2283	118 19 19	2281
	Antares	W.	67 6 30	2279	68 53 1	2274	70 39 39	2270	72 26 22	2267
	MARS	E.	37 21 21	2410	35 38 0	2407	33 54 35	2403	32 11 4	2400
	SATURN	E.	66 29 16	2274	64 42 39	2271	62 55 57	2268	61 9 10	2265
	α Arietis	E.	81 30 13	2378	79 46 7	2376	78 1 58	2374	76 17 46	2373
	Aldebaran	E.	112 1 32	2274	110 14 55	2270	108 28 11	2266	106 41 22	2263
6	Antares	W.	81 20 59	2256	83 8 3	2256	84 55 8	2255	86 42 14	2254
	α Aquilæ	W.	44 36 28	4149	45 45 43	4031	46 56 52	3926	48 9 45	3831
	MARS	E.	23 32 39	2392	21 48 53	2391	20 5 6	2392	18 21 21	2394
	SATURN	E.	52 14 22	2256	50 27 18	2255	48 40 12	2255	46 53 6	2254
	α Arietis	E.	67 36 43	2378	65 52 36	2381	64 8 34	2385	62 24 38	2389
	Aldebaran	E	97 46 17	2253	95 59 8	2252	94 11 57	2251	92 24 46	2251
7	Antares	W.	95 37 43	2258	97 24 45	2260	99 11 44	2261	100 58 41	2263
	α Aquilæ	W.	54 35 45	3483	55 56 28	3432	57 18 8	3386	58 40 40	3345
	SATURN	E.	37 57 41	2259	36 10 41	2261	34 23 44	2263	32 36 50	2266
	α Arietis	E.	53 47 3	2428	52 4 7	2438	50 21 26	2450	48 39 3	2464
	Aldebaran	E.	83 28 53	2254	81 41 46	2256	79 54 42	2258	78 7 40	2260
	SUN	E.	120 26 31	2542	118 46 17	2543	117 6 4	2545	115 25 54	2548
8	Antares	W.	109 52 29	2278	111 39 1	2282	113 25 27	2286	115 11 47	2290

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.			P. L. of Diff.	III^h			P. L. of Diff.	VI^h			P. L. of Diff.	IX^h			P. L. of Diff.
			°	′	″		°	′	″		°	′	″		°	′	″	
8	α Aquilæ	W.	60	3	59	3308	61	28	1	3275	62	52	42	3245	64	17	58	3219
	SATURN	E.	30	50	0	2269	29	3	15	2272	27	16	34	2276	25	29	58	2280
	α Arietis	E.	46	56	59	2480	45	15	17	2497	43	33	59	2516	41	53	8	2537
	Aldebaran	E.	76	20	42	2263	74	33	48	2265	72	46	57	2268	71	0	10	2271
	SUN	E.	113	45	47	2550	112	5	43	2553	110	25	43	2555	108	45	46	2558
9	α Aquilæ	W.	71	31	9	3124	72	58	50	3111	74	26	46	3101	75	54	55	3093
	Fomalhaut	W.	36	19	47	2783	37	54	37	2748	39	30	13	2718	41	6	29	2692
	Aldebaran	E.	62	7	34	2291	60	21	21	2295	58	35	14	2300	56	49	14	2305
	SUN	E.	100	27	10	2576	98	47	43	2580	97	8	21	2585	95	29	5	2589
10	α Aquilæ	W.	83	17	34	3073	84	46	16	3074	86	14	57	3076	87	43	36	3079
	Fomalhaut	W.	49	15	5	2608	50	53	49	2599	52	32	45	2591	54	11	53	2583
	α Pegasi	W.	36	25	36	3712	37	42	10	3610	39	0	34	3517	40	20	39	3437
	MARS	W.	24	49	50	2454	26	32	8	2458	28	14	20	2462	29	56	26	2467
	Aldebaran	E.	48	1	13	2334	46	16	3	2340	44	31	2	2347	42	46	11	2355
	SUN	E.	87	14	22	2614	85	35	46	2619	83	57	18	2624	82	18	56	2630
11	α Aquilæ	W.	95	5	22	3115	96	33	14	3126	98	0	52	3138	99	28	15	3152
	Fomalhaut	W.	62	29	23	2566	64	9	4	2566	65	48	46	2566	67	28	28	2567
	α Pegasi	W.	47	20	23	3163	48	47	17	3126	50	14	55	3093	51	43	13	3065
	MARS	W.	38	25	13	2492	40	6	37	2498	41	47	53	2503	43	29	2	2509
	Aldebaran	E.	34	4	47	2398	32	21	10	2409	30	37	48	2420	28	54	42	2433
	SUN	E.	74	9	5	2660	72	31	31	2666	70	54	6	2672	69	16	49	2679
12	Fomalhaut	W.	75	46	27	2579	77	25	51	2583	79	5	10	2587	80	44	23	2592
	α Pegasi	W.	59	12	15	2967	60	43	10	2954	62	14	21	2943	63	45	46	2933
	MARS	W.	51	52	45	2539	53	33	4	2545	55	13	15	2551	56	53	17	2558
	SATURN	W.	25	30	53	2418	27	14	2	2424	28	57	3	2429	30	39	57	2435
	SUN	E.	61	12	40	2713	59	36	18	2720	58	0	5	2728	56	24	2	2735
13	Fomalhaut	W.	88	58	36	2623	90	37	0	2630	92	15	15	2638	93	53	19	2646
	α Pegasi	W.	71	25	7	2909	72	57	14	2908	74	29	23	2908	76	1	32	2909
	MARS	W.	65	11	11	2592	66	50	17	2599	68	29	14	2606	70	8	1	2613
	SATURN	W.	39	12	17	2467	40	54	17	2473	42	36	8	2480	44	17	49	2487
	SUN	E.	48	26	19	2775	46	51	18	2784	45	16	29	2792	43	41	50	2801
14	Fomalhaut	W.	102	0	44	2692	103	37	34	2703	105	14	10	2714	106	50	31	2726
	α Pegasi	W.	83	41	35	2926	85	13	20	2932	86	44	58	2939	88	16	27	2946
	MARS	W.	78	19	24	2652	79	57	9	2660	81	34	43	2668	83	12	6	2676
	SATURN	W.	52	43	43	2525	54	24	22	2533	56	4	50	2541	57	45	7	2549
	SUN	E.	35	51	35	2848	34	18	10	2859	32	44	58	2869	31	12	0	2880
19	SUN	W.	24	16	59	3284	25	41	29	3291	27	5	51	3298	28	30	5	3306
	Spica	E.	62	52	21	2928	61	20	38	2939	59	49	9	2949	58	17	52	2960
	Antares	E.	108	45	35	2917	107	13	38	2926	105	41	52	2935	104	10	17	2943
20	SUN	W.	35	29	2	3344	36	52	22	3351	38	15	34	3358	39	38	38	3366
	Spica	E.	50	44	45	3011	49	14	46	3021	47	45	0	3031	46	15	26	3041
	Antares	E.	96	35	4	2985	95	4	33	2993	93	34	13	3001	92	4	2	3009
21	SUN	W.	46	31	53	3400	47	54	9	3406	49	16	19	3411	50	38	23	3416

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XV$^{\text{h}}$	P. L. of Diff.	XVIII$^{\text{h}}$	P. L. of Diff.	XXI$^{\text{h}}$	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
8	*a* Aquilæ	W.	65 43 45	3195	67 10 0	3173	68 36 41	3154	70 3 45	3138
	Saturn	E.	23 43 29	2285	21 57 7	2290	20 10 53	2296	18 24 48	2302
	a Arietis	E.	40 12 46	2562	38 32 59	2591	36 53 51	2623	35 15 26	2659
	Aldebaran	E.	69 13 28	2274	67 26 51	2278	65 40 20	2282	63 53 54	2286
	Sun	E.	107 5 53	2561	105 26 5	2565	103 46 22	2568	102 6 43	2572
9	*a* Aquilæ	W.	77 23 14	3086	78 51 41	3081	80 20 15	3077	81 48 53	3074
	Fomalhaut	W.	42 43 21	2670	44 20 43	2651	45 58 29	2635	47 36 37	2620
	Aldebaran	E.	55 3 22	2310	53 17 38	2316	51 32 1	2322	49 46 33	2327
	Sun	E.	93 49 55	2594	92 10 52	2599	90 31 55	2604	88 53 5	2609
10	*a* Aquilæ	W.	89 12 12	3083	90 40 42	3089	92 9 4	3096	93 37 18	3105
	Fomalhaut	W.	55 51 12	2578	57 30 38	2574	59 10 8	2570	60 49 43	2567
	a Pegasi	W.	41 42 14	3367	43 5 8	3306	44 29 12	3253	45 54 19	3205
	Mars	W.	31 38 25	2472	33 20 17	2477	35 2 3	2482	36 43 42	2487
	Aldebaran	E.	41 1 31	2362	39 17 2	2370	37 32 44	2379	35 48 39	2388
	Sun	E.	80 40 42	2636	79 2 36	2642	77 24 38	2648	75 46 48	2654
11	*a* Aquilæ	W.	100 55 22	3168	102 22 10	3184	103 48 38	3202	105 14 45	3221
	Fomalhaut	W.	69 8 9	2568	70 47 48	2570	72 27 25	2572	74 6 58	2575
	a Pegasi	W.	53 12 6	3039	54 41 30	3017	56 11 22	2997	57 41 38	2981
	Mars	W.	45 10 3	2515	46 50 56	2521	48 31 40	2527	50 12 17	2533
	Aldebaran	E.	27 11 54	2448	25 29 27	2465	23 47 24	2484	22 5 48	2505
	Sun	E.	67 39 41	2686	66 2 42	2692	64 25 52	2699	62 49 11	2706
12	Fomalhaut	W.	82 23 29	2597	84 2 28	2603	85 41 19	2609	87 20 2	2616
	a Pegasi	W.	65 17 23	2926	66 49 9	2920	68 21 3	2915	69 53 3	2912
	Mars	W.	58 33 10	2564	60 12 54	2571	61 52 29	2578	63 31 55	2585
	Saturn	W.	32 22 42	2441	34 5 19	2447	35 47 47	2453	37 30 7	2460
	Sun	E.	54 48 9	2743	53 12 26	2751	51 36 53	2759	50 1 31	2767
13	Fomalhaut	W.	95 31 12	2655	97 8 53	2663	98 46 23	2672	100 23 40	2682
	a Pegasi	W.	77 33 39	2911	79 5 44	2913	80 37 46	2917	82 9 43	2921
	Mars	W.	71 46 38	2621	73 25 5	2628	75 3 21	2635	76 41 28	2643
	Saturn	W.	45 59 21	2494	47 40 42	2502	49 21 53	2510	51 2 53	2517
	Sun	E.	42 7 23	2810	40 33 7	2819	38 59 4	2828	37 25 13	2838
14	Fomalhaut	W.	108 26 36	2739	110 2 24	2751	111 37 56	2764	113 13 11	2778
	a Pegasi	W.	89 47 47	2955	91 18 56	2964	92 49 54	2974	94 20 39	2985
	Mars	W.	84 49 18	2684	86 26 19	2692	88 3 9	2701	89 39 47	2710
	Saturn	W.	59 25 12	2557	61 5 6	2566	62 44 48	2574	64 24 19	2583
	Sun	E.	29 39 16	2893	28 6 48	2905	26 34 35	2918	25 2 39	2931
19	Sun	W.	29 54 10	3313	31 18 6	3320	32 41 54	3328	34 5 33	3337
	Spica	E.	56 46 49	2970	55 15 59	2980	53 45 22	2990	52 14 57	3001
	Antares	E.	102 38 52	2952	101 7 39	2961	99 36 37	2969	98 5 45	2977
20	Sun	W.	41 1 33	3373	42 24 19	3380	43 46 58	3387	45 9 29	3393
	Spica	E.	44 46 4	3051	43 16 55	3061	41 47 58	3071	40 19 13	3082
	Antares	E.	90 34 1	3017	89 4 9	3024	87 34 26	3031	86 4 52	3037
21	Sun	W.	52 0 21	3421	53 22 13	3426	54 44 0	3430	56 5 43	3434

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh	P. L. of Diff.	VIh	P. L. of Diff.	IXh	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
21	Spica	E.	38 50 41	3092	37 22 22	3102	35 54 15	3113	34 26 21	3125
	Antares	E.	84 35 25	3043	83 6 6	3049	81 36 54	3055	80 7 49	3060
22	SUN	W.	57 27 21	3438	58 48 55	3441	60 10 25	3443	61 31 53	3445
	JUPITER	W.	13 47 30	3307	15 11 33	3283	16 36 4	3262	18 1 0	3244
	Antares	E.	72 43 55	3082	71 15 24	3085	69 46 56	3088	68 18 32	3091
23	SUN	W.	68 18 45	3449	69 40 6	3448	71 1 27	3447	72 22 50	3446
	JUPITER	W.	25 9 26	3200	26 35 35	3194	28 1 52	3188	29 28 15	3183
	Antares	E.	60 57 10	3098	59 28 58	3098	58 0 46	3098	56 32 34	3097
	a Aquilæ	E.	106 48 59	3910	105 35 49	3898	104 22 27	3886	103 8 53	3875
24	SUN	W.	79 10 19	3431	80 32 0	3426	81 53 47	3421	83 15 39	3415
	JUPITER	W.	36 41 48	3155	38 8 51	3149	39 36 0	3143	41 3 18	3136
	Antares	E.	49 11 17	3090	47 42 55	3087	46 14 29	3084	44 45 59	3081
	a Aquilæ	E.	96 58 24	3827	95 43 50	3819	94 29 7	3811	93 14 16	3803
25	SUN	W.	90 6 46	3380	91 29 25	3372	92 52 13	3363	94 15 12	3353
	JUPITER	W.	48 21 55	3098	49 50 7	3089	51 18 30	3079	52 47 5	3070
	Antares	E.	37 22 28	3061	35 53 31	3056	34 24 28	3052	32 55 20	3049
	a Aquilæ	E.	86 58 15	3772	85 42 44	3768	84 27 9	3764	83 11 29	3759
26	SUN	W.	101 13 0	3299	102 37 13	3287	104 1 40	3274	105 26 22	3261
	JUPITER	W.	60 13 4	3016	61 42 57	3004	63 13 5	2992	64 43 28	2979
	Spica	W.	21 59 32	3109	23 27 31	3078	24 56 8	3049	26 25 20	3022
	a Aquilæ	E.	76 52 14	3748	75 36 18	3747	74 20 21	3748	73 4 25	3750
27	SUN	W.	112 33 49	3190	114 0 10	3175	115 26 49	3159	116 53 47	3144
	JUPITER	W.	72 19 32	2910	73 51 38	2895	75 24 3	2880	76 56 47	2865
	Spica	W.	33 58 56	2911	35 31 1	2891	37 3 32	2871	38 36 28	2852
	a Aquilæ	E.	66 45 33	3775	65 30 5	3785	64 14 47	3797	62 59 41	3811
	a Pegasi	E.	113 40 22	3325	112 16 40	3300	110 52 29	3276	109 27 49	3252
28	SUN	W.	124 13 25	3062	125 42 21	3045	127 11 38	3028	128 41 16	3011
	JUPITER	W.	84 45 26	2785	86 20 13	2769	87 55 21	2752	89 30 52	2735
	Spica	W.	46 27 20	2757	48 2 44	2738	49 38 33	2719	51 14 47	2701
	a Aquilæ	E.	56 48 33	3918	55 35 31	3949	54 23 1	3985	53 11 7	4026
	a Pegasi	E.	102 17 37	3140	100 50 15	3119	99 22 28	3098	97 54 16	3078
29	JUPITER	W.	97 34 1	2650	99 11 48	2633	100 49 57	2616	102 28 30	2599
	Spica	W.	59 22 4	2610	61 0 45	2592	62 39 51	2574	64 19 22	2556
	a Pegasi	E.	90 27 22	2987	88 56 53	2970	87 26 3	2954	85 54 53	2939
	SATURN	E.	121 10 42	2583	119 31 24	2565	117 51 41	2548	116 11 34	2531
30	JUPITER	W.	110 47 1	2516	112 27 52	2500	114 9 5	2484	115 50 41	2468
	Spica	W.	72 43 2	2470	74 24 58	2453	76 7 17	2436	77 50 0	2420
	Antares	W.	26 56 32	2525	28 37 11	2500	30 18 24	2477	32 0 9	2455
	SATURN	E.	107 45 9	2447	106 2 41	2431	104 19 51	2415	102 36 37	2398
31	Spica	W.	86 29 15	2344	88 14 11	2330	89 59 27	2316	91 45 3	2303
	Antares	W.	40 36 17	2359	42 20 50	2342	44 5 47	2326	45 51 8	2311
	SATURN	E.	93 54 49	2323	92 9 23	2309	90 23 37	2295	88 37 30	2282

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XV^h	P. L. of Diff.	XVIII^h	P. L. of Diff.	XXI^h	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
21	Spica	E.	32 58 42	3137	31 31 17	3149	30 4 6	3162	28 37 11	3176
	Antares	E.	78 38 50	3065	77 9 58	3070	75 41 12	3074	74 12 31	3078
22	Sun	W.	62 53 18	3447	64 14 41	3448	65 36 3	3449	66 57 24	3449
	Jupiter	W.	19 26 17	3231	20 51 49	3222	22 17 32	3214	23 43 25	3207
	Antares	E.	66 50 11	3093	65 21 53	3095	63 53 37	3096	62 25 23	3097
23	Sun	W.	73 44 14	3444	75 5 40	3441	76 27 9	3438	77 48 42	3435
	Jupiter	W.	30 54 45	3178	32 21 21	3173	33 48 3	3167	35 14 52	3161
	Antares	E.	55 4 22	3097	53 36 9	3096	52 7 54	3094	50 39 37	3092
	α Aquilæ	E.	101 55 8	3864	100 41 12	3855	99 27 6	3845	98 12 50	3835
24	Sun	W.	84 37 38	3409	85 59 43	3403	87 21 56	3396	88 44 17	3388
	Jupiter	W.	42 30 44	3129	43 58 18	3122	45 26 1	3114	46 53 53	3106
	Antares	E.	43 17 26	3077	41 48 49	3073	40 20 7	3069	38 51 20	3065
	α Aquilæ	E.	91 59 17	3796	90 44 11	3790	89 28 59	3784	88 13 40	3778
25	Sun	W.	95 38 22	3343	97 1 43	3333	98 25 16	3322	99 49 1	3311
	Jupiter	W.	54 15 51	3060	55 44 50	3050	57 14 1	3039	58 43 26	3028
	Antares	E.	31 26 8	3046	29 56 52	3043	28 27 32	3040	26 58 9	3037
	α Aquilæ	E.	81 55 44	3756	80 39 55	3753	79 24 4	3750	78 8 10	3749
26	Sun	W.	106 51 19	3248	108 16 31	3234	109 42 0	3220	111 7 46	3205
	Jupiter	W.	66 14 7	2965	67 45 3	2952	69 16 15	2938	70 47 44	2924
	Spica	W.	27 55 5	2998	29 25 21	2975	30 56 5	2953	32 27 17	2931
	α Aquilæ	E.	71 48 31	3752	70 32 39	3756	69 16 51	3762	68 1 9	3768
27	Sun	W.	118 21 3	3128	119 48 39	3112	121 16 34	3096	122 44 49	3079
	Jupiter	W.	78 29 50	2850	80 3 13	2834	81 36 56	2818	83 11 1	2802
	Spica	W.	40 9 49	2833	41 43 35	2814	43 17 45	2795	44 52 20	2776
	α Aquilæ	E.	61 44 50	3826	60 30 15	3844	59 15 58	3865	58 2 3	3890
	α Pegasi	E.	108 2 41	3229	106 37 5	3206	105 11 3	3183	103 44 33	3161
28	Sun	W.	130 11 15	2994	131 41 35	2977	133 12 17	2959	134 43 21	2942
	Jupiter	W.	91 6 45	2719	92 43 0	2702	94 19 37	2685	95 56 37	2667
	Spica	W.	52 51 25	2683	54 28 28	2665	56 5 55	2646	57 43 47	2628
	α Aquilæ	E.	51 59 53	4073	50 49 25	4125	49 39 47	4184	48 31 6	4251
	α Pegasi	E.	96 25 40	3059	94 56 40	3040	93 27 16	3022	91 57 30	3004
29	Jupiter	W.	104 7 26	2583	105 46 45	2566	107 26 27	2549	109 6 33	2533
	Spica	W.	65 59 17	2538	67 39 37	2521	69 20 21	2504	71 1 30	2487
	α Pegasi	E.	84 23 23	2925	82 51 35	2911	81 19 30	2898	79 47 8	2884
	Saturn	E.	114 31 4	2515	112 50 11	2497	111 8 54	2480	109 27 13	2464
30	Jupiter	W.	117 32 39	2453	119 14 58	2438	120 57 39	2423	122 40 41	2408
	Spica	W.	79 33 6	2404	81 16 35	2389	83 0 26	2373	84 44 40	2358
	Antares	W.	33 42 26	2434	35 25 12	2414	37 8 27	2395	38 52 9	2377
	Saturn	E.	100 53 0	2382	99 9 0	2367	97 24 38	2352	95 39 54	2337
31	Spica	W.	93 30 59	2290	95 17 13	2277	97 3 46	2265	98 50 37	2254
	Antares	W.	47 36 51	2296	49 22 56	2282	51 9 21	2269	52 56 7	2256
	Saturn	E.	86 51 4	2269	85 4 18	2256	83 17 14	2244	81 29 52	2232

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S Apparent Right Ascension.	THE SUN'S Diff. for 1 Hour.	THE SUN'S Apparent Declination.	THE SUN'S Diff. for 1 Hour.	THE SUN'S Semi-diameter.	Sidereal Time of Semi-diameter Passing Meridian.	Equation of Time, to be Added to Apparent Time.	Diff. for 1 Hour.
		h m s	s	° ′ ″	″	′ ″	s	m s	s
SUN.	1	8 43 58.50	9.715	N.18 7 48.3	−37.46	15 47.47	66.64	6 8.82	0.140
Mon.	2	8 47 51.37	9.689	17 52 40.5	38.19	15 47.60	66.55	6 5.15	0.165
Tues.	3	8 51 43.64	9.664	17 37 15.2	38.91	15 47.73	66.46	6 0.88	0.190
Wed.	4	8 55 35.31	9.640	17 21 32.7	−39.62	15 47.86	66.37	5 56.01	0.215
Thur.	5	8 59 26.39	9.616	17 5 33.4	40.32	15 47.99	66.29	5 50.55	0.240
Frid.	6	9 3 16.90	9.592	16 49 17.3	41.01	15 48.12	66.20	5 44.51	0.264
Sat.	7	9 7 6.82	9.568	16 32 44.9	−41.69	15 48.26	66.12	5 37.90	0.288
SUN.	8	9 10 56.17	9.545	16 15 56.5	42.35	15 48.40	66.03	5 30.72	0.311
Mon.	9	9 14 44.96	9.521	15 58 52.2	43.00	15 48.55	65.95	5 22.97	0.334
Tues.	10	9 18 33.18	9.498	15 41 32.4	−43.64	15 48.70	65.86	5 14.65	0.358
Wed.	11	9 22 20.84	9.475	15 23 57.5	44.27	15 48.86	65.78	5 5.78	0.381
Thur.	12	9 26 7.95	9.452	15 6 7.7	44.88	15 49.02	65.70	4 56.37	0.404
Frid.	13	9 29 54.52	9.429	14 48 3.4	−45.48	15 49.19	65.62	4 46.41	0.427
Sat.	14	9 33 40.54	9.406	14 29 44.8	46.07	15 49.36	65.54	4 35.90	0.449
SUN.	15	9 37 26.02	9.383	14 11 12.3	46.64	15 49.53	65.46	4 24.85	0.471
Mon.	16	9 41 10.96	9.361	13 52 26.2	−47.20	15 49.71	65.38	4 13.27	0.493
Tues.	17	9 44 55.37	9.339	13 33 26.9	47.74	15 49.89	65.31	4 1.16	0.515
Wed.	18	9 48 39.26	9.318	13 14 14.6	48.27	15 50.08	65.23	3 48.53	0.537
Thur.	19	9 52 22.63	9.297	12 54 49.7	−48.79	15 50.27	65.16	3 35.39	0.558
Frid.	20	9 56 5.51	9.276	12 35 12.6	49.29	15 50.46	65.09	3 21.75	0.579
Sat.	21	9 59 47.89	9.256	12 15 23.6	49.78	15 50.66	65.02	3 7.62	0.599
SUN.	22	10 3 29.79	9.236	11 55 23.0	−50.26	15 50.86	64.95	2 53.00	0.619
Mon.	23	19 7 11.21	9.217	11 35 11.1	50.72	15 51.07	64.89	2 37.90	0.638
Tues.	24	10 10 52.18	9.198	11 14 48.3	51.17	15 51.28	64.82	2 22.35	0.657
Wed.	25	10 14 32.70	9.180	10 54 14.8	−51.61	15 51.50	64.76	2 6.36	0.675
Thur.	26	10 18 12.79	9.162	10 33 31.1	52.03	15 51.71	64.70	1 49.95	0.693
Frid.	27	10 21 52.46	9.145	10 12 37.5	52.44	15 51.93	64.65	1 33.12	0.710
Sat.	28	10 25 31.74	9.128	9 51 34.2	−52.83	15 52.15	64.59	1 15.89	0.726
SUN.	29	10 29 10.64	9.112	9 30 21.5	53.21	15 52.37	64.54	0 58.28	0.742
Mon.	30	10 32 49.17	9.097	9 8 59.9	53.58	15 52.59	64.49	0 40.30	0.756
Tues.	31	10 36 27.36	9.084	8 47 29.7	53.94	15 52.82	64.44	0 21.99	0.769
Wed.	32	10 40 5.24	9.072	N. 8 25 50.8	−54.29	15 53.04	64.39	0 3.37	0.782

NOTE.—The mean time of semidiameter passing the meridian may be found by subtracting $0^{s}.19$ from the sidereal time.
The sign − prefixed to the hourly change of declination indicates that north declinations are decreasing.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Equation of Time, to be Subtracted from Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		h m s	s	° ′ ″	″	m s	s	h m s
SUN.	1	8 43 57.51	9.717	N.18 7 52.2	−37.46	6 8.84	0.140	8 37 48.66
Mon.	2	8 47 50.39	9.692	17 52 44.4	38.19	6 5.17	0.166	8 41 45.22
Tues.	3	8 51 42.67	9.666	17 37 19.1	38.91	6 0.90	0.190	8 45 41.77
Wed.	4	8 55 34.36	9.641	17 21 36.6	−39.62	5 56.03	0.215	8 49 38.33
Thur.	5	8 59 25.46	9.617	17 5 37.2	40.33	5 50.57	0.240	8 53 34.89
Frid.	6	9 3 15.98	9.593	16 49 21.2	41.02	5 44.53	0.264	8 57 31.45
Sat.	7	9 7 5.92	9.569	16 32 48.8	−41.69	5 37.92	0.288	9 1 28.00
SUN.	8	9 10 55.29	9.545	16 16 0.3	42.35	5 30.74	0.311	9 5 24.55
Mon.	9	9 14 44.10	9.522	15 58 56.0	43.01	5 22.99	0.334	9 9 21.11
Tues.	10	9 18 32.35	9.499	15 41 36.2	−43.65	5 14.68	0.358	9 13 17.66
Wed.	11	9 22 20.04	9.476	15 24 1.2	44.27	5 5.82	0.381	9 17 14.22
Thur.	12	9 26 7.18	9.453	15 6 11.4	44.88	4 56.41	0.404	9 21 10.77
Frid.	13	9 29 53.77	9.430	14 48 7.0	−45.48	4 46.45	0.427	9 25 7.33
Sat.	14	9 33 39.82	9.407	14 29 48.3	46.07	4 35.94	0.449	9 29 3.88
SUN.	15	9 37 25.33	9.384	14 11 15.7	46.64	4 24.89	0.471	9 33 0.44
Mon.	16	9 41 10.30	9.362	13 52 29.5	−47.20	4 13.31	0.493	9 36 56.99
Tues.	17	9 44 54.74	9.341	13 33 30.1	47.75	4 1.20	0.515	9 40 53.55
Wed.	18	9 48 38.67	9.319	13 14 17.7	48.28	3 48.57	0.537	9 44 50.10
Thur.	19	9 52 22.08	9.298	12 54 52.7	−48.80	3 35.43	0.558	9 48 46.66
Frid.	20	9 56 4.99	9.278	12 35 15.4	49.30	3 21.78	0.579	9 52 43.21
Sat.	21	9 59 47.41	9.257	12 15 26.2	49.79	3 7.64	0.599	9 56 39.77
SUN.	22	10 3 29.35	9.237	11 55 25.4	−50.27	2 53.02	0.619	10 0 36.32
Mon.	23	10 7 10.81	9.218	11 35 13.3	50.74	2 37.93	0.638	10 4 32.88
Tues.	24	10 10 51.82	9.199	11 14 50.3	51.19	2 22.38	0.657	10 8 29.43
Wed.	25	10 14 32.38	9.181	10 54 16.6	−51.62	2 6.39	0.675	10 12 25.99
Thur.	26	10 18 12.51	9.164	10 33 32.7	52.04	1 49.97	0.693	10 16 22.54
Frid.	27	10 21 52.23	9.147	10 12 38.9	52.45	1 33.13	0.710	10 20 19.09
Sat.	28	10 25 31.55	9.130	9 51 35.3	−52.84	1 15.90	0.726	10 24 15.65
SUN.	29	10 29 10.49	9.115	9 30 22.3	53.22	0 58.29	0.742	10 28 12.20
Mon.	30	10 32 49.06	9.100	9 9 0.5	53.60	0 40.31	0.756	10 32 8.76
Tues.	31	10 36 27.30	9.087	8 47 30.0	53.95	0 21.99	0.769	10 36 5.31
Wed.	32	10 40 5.23	9.074	N. 8 25 51.0	−54.30	0 3.37	0.782	10 40 1.86

Note.—The semidiameter for mean noon may be assumed the same as that for apparent noon.
The sign − prefixed to the hourly change of declination indicates that north declinations are decreasing.

Diff. for 1 Hour,
+ 9ˢ.8565.
(Table III.)

AT GREENWICH MEAN NOON.								
Day of the Month.	Day of the Year.	THE SUN'S						Mean Time of Sidereal Noon.
		TRUE LONGITUDE.		Diff. for 1 Hour.	LATITUDE.	Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	
		λ	λ′					
		° ′ ″	′ ″	″	″			h m s
1	213	128 34 1.4	33 47.4	143.48	— 0.15	0.006 3802	– 23.6	15 19 40.26
2	214	129 31 25.3	31 11.2	143.52	0.23	0.006 3229	24.1	15 15 44.35
3	215	130 28 50.2	28 36.0	143.56	0.28	0.006 2644	24.6	15 11 48.44
4	216	131 26 16.2	26 1.8	143.61	— 0.28	0.006 2048	– 25.1	15 7 52.53
5	217	132 23 43.4	23 28.9	143.66	0.26	0.006 1439	25.7	15 3 56.62
6	218	133 21 11.8	20 57.2	143.71	0.23	0.006 0816	26.3	15 0 0.71
7	219	134 18 41.6	18 26.8	143.77	— 0.14	0.006 0179	– 26.9	14 56 4.80
8	220	135 16 12.7	15 57.8	143.83	— 0.04	0.005 9526	27.6	14 52 8.89
9	221	136 13 45.3	13 30.2	143.89	+ 0.08	0.005 8856	28.3	14 48 12.98
10	222	137 11 19.2	11 4.0	143.95	+ 0.21	0.005 8167	– 29.1	14 44 17.07
11	223	138 8 54.6	8 39.3	144.00	0.34	0.005 7459	29.9	14 40 21.16
12	224	139 6 31.4	6 15.9	144.06	0.46	0.005 6730	30.8	14 36 25.25
13	225	140 4 9.6	3 54.0	144.12	+ 0.57	0.005 5981	– 31.7	14 32 29.34
14	226	141 1 49.1	1 33.4	144.18	0.67	0.005 5211	32.6	14 28 33.44
15	227	141 59 30.0	59 14.1	144.23	0.74	0.005 4418	33.5	14 24 37.53
16	228	142 57 12.2	56 56.2	144.29	+ 0.77	0.005 3605	– 34.4	14 20 41.62
17	229	143 54 55.7	54 39.5	144.34	0.80	0.005 2770	35.2	14 16 45.71
18	230	144 52 40.4	52 24.2	144.39	0.78	0.005 1914	36.1	14 12 49.80
19	231	145 50 26.4	50 10.0	144.44	+ 0.76	0.005 1039	– 36.9	14 8 53.89
20	232	146 48 13.6	47 57.1	144.49	0.69	0.005 0145	37.7	14 4 57.98
21	233	147 46 2.0	45 45.4	144.54	0.60	0.004 9232	38.4	14 1 2.07
22	234	148 43 51.6	43 34.9	144.59	+ 0.50	0.004 8303	– 39.1	13 57 6.16
23	235	149 41 42.4	41 25.6	144.64	0.39	0.004 7357	39.7	13 53 10.26
24	236	150 39 34.5	39 17.5	144.69	0.26	0.004 6397	40.3	13 49 14.35
25	237	151 37 27.8	37 10.6	144.74	+ 0.13	0.004 5423	– 40.8	13 45 18.44
26	238	152 35 22.3	35 5.0	144.80	+ 0.01	0.004 4437	41.3	13 41 22.53
27	239	153 33 18.1	33 0.7	144.85	— 0.11	0.004 3441	41.7	13 37 26.62
28	240	154 31 15.2	30 57.7	144.91	— 0.22	0.004 2436	– 42.0	13 33 30.72
29	241	155 29 13.8	28 56.2	144.97	0.30	0.004 1423	42.3	13 29 34.81
30	242	156 27 13.8	26 56.1	145.03	0.35	0.004 0404	42.6	13 25 38.90
31	243	157 25 15.4	24 57.6	145.10	0.38	0.003 9379	42.8	13 21 42.99
32	244	158 23 18.6	23 0.7	145.17	— 0.36	0.003 8349	– 43.0	13 17 47.08
								Diff. for 1 Hour, — $9^s.8296$. (Table II.)

NOTE.—The numbers in column λ correspond to the true equinox of the date; in column λ′ to the mean equinox of January $0^d.0$.

GREENWICH MEAN TIME.

THE MOON'S

Day of the Month.	SEMIDIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
	′ ″	′ ″	′ ″	″	′ ″	″	h m	m	d
1	16 15.0	16 19.5	59 32.4	+ 1.50	59 49.0	+ 1.28	12 18.0	2.47	15.1
2	16 23.2	16 25.9	60 2.4	0.98	60 12.5	0.69	13 16.0	2.36	16.1
3	16 27.7	16 28.5	60 19.1	+ 0.40	60 22.0	+ 0.10	14 11.3	2.24	17.1
4	16 28.4	16 27.3	60 21.5	− 0.18	60 17.6	− 0.45	15 3.9	2.15	18.1
5	16 25.4	16 22.8	60 10.8	0.69	60 1.3	0.90	15 54.7	2.10	19.1
6	16 19.5	16 15.7	59 49.1	1.08	59 35.1	1.22	16 44.8	2.09	20.1
7	16 11.5	16 7.0	59 19.7	− 1.33	59 3.2	− 1.41	17 35.3	2.12	21.1
8	16 2.3	15 57.5	58 45.9	1.46	58 28.1	1.49	18 26.9	2.19	22.1
9	15 52.6	15 47.7	58 10.1	1.50	57 52.1	1.49	19 20.3	2.26	23.1
10	15 42.9	15 38.1	57 34.4	− 1.47	57 16.9	− 1.44	20 15.0	2.30	24.1
11	15 33.4	15 28.9	56 59.8	1.40	56 43.2	1.36	21 10.4	2.30	25.1
12	15 24.5	15 20.3	56 27.1	1.32	56 11.6	1.27	22 5.1	2.24	26.1
13	15 16.2	15 12.3	55 56.6	− 1.22	55 42.2	− 1.17	22 57.7	2.14	27.1
14	15 8.6	15 5.0	55 28.4	1.12	55 15.3	1.06	23 47.5	2.01	28.1
15	15 1.6	14 58.5	55 3.0	1.00	54 51.5	0.93	6	. . .	29.1
16	14 55.6	14 52.9	54 40.8	− 0.84	54 31.1	− 0.75	0 34.2	1.88	0.5
17	14 50.6	14 48.7	54 22.6	0.65	54 15.4	0.55	1 18.1	1.78	1.5
18	14 47.1	14 45.9	54 9.5	0.42	54 5.3	− 0.28	1 59.8	1.70	2.5
19	14 45.2	14 45.0	54 2.7	− 0.14	54 1.9	+ 0.02	2 40.1	1.66	3.5
20	14 45.4	14 46.3	54 3.2	+ 0.19	54 6.5	0.37	3 19.9	1.67	4.5
21	14 47.8	14 49.9	54 12.1	0.56	54 20.0	0.76	4 0.3	1.71	5.5
22	14 52.7	14 56.2	54 30.3	+ 0.96	54 43.0	+ 1.16	4 42.3	1.79	6.5
23	15 0.3	15 5.1	54 58.2	1.36	55 15.8	1.56	5 26.7	1.92	7.5
24	15 10.5	15 16.6	55 35.7	1.75	55 57.8	1.92	6 14.5	2.07	8.5
25	15 23.1	15 30.1	56 21.8	+ 2.07	56 47.6	+ 2.20	7 6.3	2.24	9.5
26	15 37.5	15 45.1	57 14.7	2.30	57 42.7	2.35	8 1.9	2.38	10.5
27	15 52.9	16 0.6	58 11.1	2.37	58 39.5	2.33	9 0.3	2.48	11.5
28	16 8.1	16 15.2	59 7.1	+ 2.24	59 33.2	+ 2.09	10 0.0	2.49	12.5
29	16 21.8	16 27.6	59 57.3	1.89	60 18.6	1.63	10 59.1	2.43	13.5
30	16 32.5	16 36.3	60 36.5	1.33	60 50.5	0.98	11 56.4	2.34	14.5
31	16 38.9	16 40.3	61 0.1	+ 0.61	61 5.2	+ 0.23	12 51.4	2.25	15.5
32	16 40.4	16 39.3	61 5.7	− 0.15	61 1.6	− 0.52	13 44.5	2.19	16.5

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	SUNDAY 1.					TUESDAY 3.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	20 26 31.83	2.5639	S. 23 5 43.7	6.466	0	22 25 50.85	2.3876	S. 15 9 41.6	12.845
1	20 29 5.60	2.5619	22 59 10.9	6.627	1	22 28 13.97	2.3832	14 56 48.0	12.941
2	20 31 39.26	2.5598	22 52 28.5	6.786	2	22 30 36.83	2.3787	14 43 48.7	13.035
3	20 34 12.78	2.5576	22 45 36.6	6.945	3	22 32 59.42	2.3743	14 30 43.8	13.127
4	20 36 46.17	2.5553	22 38 35.1	7.104	4	22 35 21.75	2.3699	14 17 33.4	13.217
5	20 39 19.42	2.5529	22 31 24.1	7.262	5	22 37 43.81	2.3656	14 4 17.7	13.307
6	20 41 52.52	2.5503	22 24 3.7	7.418	6	22 40 5.62	2.3612	13 50 56.6	13.394
7	20 44 25.46	2.5478	22 16 33.9	7.573	7	22 42 27.16	2.3568	13 37 30.4	13.479
8	20 46 58.25	2.5452	22 8 54.9	7.727	8	22 44 48.44	2.3526	13 23 59.1	13.562
9	20 49 30.88	2.5423	22 1 6.6	7.882	9	22 47 9.47	2.3483	13 10 22.9	13.644
10	20 52 3.33	2.5393	21 53 9.0	8.035	10	22 49 30.24	2.3440	12 56 41.8	13.725
11	20 54 35.60	2.5364	21 45 2.4	8.186	11	22 51 50.75	2.3397	12 42 55.9	13.803
12	20 57 7.70	2.5334	21 36 46.7	8.337	12	22 54 11.01	2.3356	12 29 5.4	13.879
13	20 59 39.61	2.5302	21 28 22.0	8.487	13	22 56 31.02	2.3313	12 15 10.4	13.954
14	21 2 11.33	2.5270	21 19 48.3	8.635	14	22 58 50.78	2.3272	12 1 10.9	14.027
15	21 4 42.85	2.5237	21 11 5.8	8.782	15	23 1 10.29	2.3232	11 47 7.1	14.098
16	21 7 14.17	2.5202	21 2 14.5	8.927	16	23 3 29.55	2.3191	11 32 59.1	14.167
17	21 9 45.28	2.5168	20 53 14.5	9.072	17	23 5 48.57	2.3150	11 18 47.0	14.235
18	21 12 16.19	2.5133	20 44 5.8	9.216	18	23 8 7.35	2.3110	11 4 30.9	14.301
19	21 14 46.88	2.5097	20 34 48.6	9.358	19	23 10 25.89	2.3071	10 50 10.9	14.365
20	21 17 17.35	2.5060	20 25 22.8	9.500	20	23 12 44.20	2.3032	10 35 47.1	14.427
21	21 19 47.60	2.5023	20 15 48.6	9.639	21	23 15 2.27	2.2992	10 21 19.6	14.487
22	21 22 17.63	2.4986	20 6 6.1	9.777	22	23 17 20.11	2.2955	10 6 48.6	14.546
23	21 24 47.43	2.4947	S. 19 56 15.4	9.914	23	23 19 37.73	2.2917	S. 9 52 14.1	14.603
	MONDAY 2.					WEDNESDAY 4.			
0	21 27 16.99	2.4907	S. 19 46 16.4	10.050	0	23 21 55.12	2.2880	S. 9 37 36.2	14.658
1	21 29 46.32	2.4868	19 36 9.4	10.184	1	23 24 12.29	2.2843	9 22 55.1	14.712
2	21 32 15.41	2.4828	19 25 54.3	10.317	2	23 26 29.24	2.2807	9 8 10.8	14.764
3	21 34 44.26	2.4787	19 15 31.3	10.448	3	23 28 45.97	2.2770	8 53 23.4	14.814
4	21 37 12.86	2.4747	19 5 0.5	10.577	4	23 31 2.48	2.2735	8 38 33.1	14.862
5	21 39 41.22	2.4706	18 54 22.0	10.706	5	23 33 18.79	2.2702	8 23 40.0	14.907
6	21 42 9.33	2.4664	18 43 35.8	10.833	6	23 35 34.90	2.2667	8 8 44.2	14.952
7	21 44 37.19	2.4622	18 32 42.0	10.959	7	23 37 50.80	2.2633	7 53 45.7	14.996
8	21 47 4.79	2.4579	18 21 40.7	11.082	8	23 40 6.50	2.2600	7 38 44.7	15.037
9	21 49 32.14	2.4537	18 10 32.1	11.204	9	23 42 22.00	2.2567	7 23 41.3	15.076
10	21 51 59.23	2.4493	17 59 16.2	11.326	10	23 44 37.31	2.2536	7 8 35.6	15.113
11	21 54 26.06	2.4450	17 47 53.0	11.445	11	23 46 52.43	2.2504	6 53 27.7	15.149
12	21 56 52.63	2.4407	17 36 22.8	11.562	12	23 49 7.36	2.2473	6 38 17.7	15.183
13	21 59 18.94	2.4362	17 24 45.6	11.678	13	23 51 22.11	2.2444	6 23 5.7	15.216
14	22 1 44.98	2.4318	17 13 1.4	11.792	14	23 53 36.69	2.2415	6 7 51.8	15.247
15	22 4 10.76	2.4275	17 1 10.5	11.905	15	23 55 51.09	2.2385	5 52 36.1	15.276
16	22 6 36.28	2.4231	16 49 12.8	12.017	16	23 58 5.31	2.2357	5 37 18.7	15.303
17	22 9 1.53	2.4187	16 37 8.5	12.126	17	0 0 19.37	2.2330	5 21 59.7	15.329
18	22 11 26.52	2.4142	16 24 57.7	12.233	18	0 2 33.27	2.2303	5 6 39.2	15.353
19	22 13 51.24	2.4098	16 12 40.5	12.340	19	0 4 47.01	2.2277	4 51 17.3	15.376
20	22 16 15.70	2.4054	16 0 16.9	12.444	20	0 7 0.59	2.2251	4 35 54.1	15.396
21	22 18 39.89	2.4009	15 47 47.2	12.547	21	0 9 14.02	2.2226	4 20 29.8	15.415
22	22 21 3.81	2.3964	15 35 11.3	12.648	22	0 11 27.30	2.2201	4 5 4.3	15.432
23	22 23 27.46	2.3920	15 22 29.4	12.747	23	0 13 40.43	2.2177	3 49 37.9	15.447
24	22 25 50.85	2.3876	S. 15 9 41.6	12.845	24	0 15 53.43	2.2156	S. 3 34 10.6	15.462

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
THURSDAY 5.					SATURDAY 7.				
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	0 15 53.43	2.2156	S. 3 34 10.6	15.462	0	2 0 55.97	2.1879	N. 8 34 29.3	14.335
1	0 18 6.30	2.2133	3 18 42.5	15.474	1	2 3 7.28	2.1890	8 48 47.7	14.277
2	0 20 19.03	2.2112	3 3 13.7	15.485	2	2 5 18.65	2.1901	9 3 2.5	14.217
3	0 22 31.64	2.2091	2 47 44.3	15.493	3	2 7 30.09	2.1912	9 17 13.7	14.157
4	0 24 44.12	2.2070	2 32 14.5	15.501	4	2 9 41.60	2.1925	9 31 21.3	14.096
5	0 26 56.48	2.2051	2 16 44.2	15.507	5	2 11 53.19	2.1938	9 45 25.2	14.032
6	0 29 8.73	2.2032	2 1 13.6	15.512	6	2 14 4.86	2.1952	9 59 25.2	13.967
7	0 31 20.87	2.2015	1 45 42.8	15.514	7	2 16 16.61	2.1966	10 13 21.3	13.902
8	0 33 32.91	2.1997	1 30 11.9	15.515	8	2 18 28.45	2.1981	10 27 13.4	13.835
9	0 35 44.84	2.1980	1 14 41.0	15.514	9	2 20 40.38	2.1996	10 41 1.5	13.767
10	0 37 56.67	2.1964	0 59 10.2	15.512	10	2 22 52.40	2.2011	10 54 45.4	13.697
11	0 40 8.41	2.1949	0 43 39.5	15.509	11	2 25 4.51	2.2027	11 8 25.2	13.627
12	0 42 20.06	2.1935	0 28 9.1	15.503	12	2 27 16.73	2.2045	11 22 0.7	13.555
13	0 44 31.63	2.1921	S. 0 12 39.1	15.497	13	2 29 29.05	2.2062	11 35 31.8	13.482
14	0 46 43.11	2.1907	N. 0 2 50.5	15.488	14	2 31 41.47	2.2079	11 48 58.5	13.408
15	0 48 54.52	2.1896	0 18 19.5	15.478	15	2 33 54.00	2.2097	12 2 20.7	13.332
16	0 51 5.86	2.1884	0 33 47.9	15.467	16	2 36 6.64	2.2116	12 15 38.4	13.255
17	0 53 17.13	2.1873	0 49 15.5	15.453	17	2 38 19.39	2.2135	12 28 51.4	13.177
18	0 55 28.34	2.1863	1 4 42.3	15.440	18	2 40 32.26	2.2155	12 41 59.7	13.099
19	0 57 39.49	2.1853	1 20 8.3	15.424	19	2 42 45.25	2.2175	12 55 3.3	13.019
20	0 59 50.58	2.1844	1 35 33.2	15.406	20	2 44 58.36	2.2195	13 8 2.0	12.937
21	1 2 1.62	2.1837	1 50 57.0	15.387	21	2 47 11.59	2.2216	13 20 55.7	12.854
22	1 4 12.62	2.1829	2 6 19.6	15.367	22	2 49 24.95	2.2237	13 33 44.5	12.771
23	1 6 23.57	2.1822	N. 2 21 41.0	15.345	23	2 51 38.43	2.2258	N. 13 46 28.2	12.686
FRIDAY 6.					SUNDAY 8.				
0	1 8 34.49	2.1817	N. 2 37 1.0	15.322	0	2 53 52.05	2.2281	N. 13 59 6.8	12.600
1	1 10 45.37	2.1812	2 52 19.6	15.297	1	2 56 5.80	2.2303	14 11 40.2	12.512
2	1 12 56.23	2.1807	3 7 36.6	15.269	2	2 58 19.69	2.2326	14 24 8.3	12.423
3	1 15 7.06	2.1803	3 22 51.9	15.242	3	3 0 33.71	2.2348	14 36 31.0	12.333
4	1 17 17.87	2.1800	3 38 5.6	15.213	4	3 2 47.87	2.2372	14 48 48.3	12.243
5	1 19 28.66	2.1797	3 53 17.5	15.182	5	3 5 2.17	2.2395	15 1 0.2	12.152
6	1 21 39.44	2.1796	4 8 27.5	15.150	6	3 7 16.61	2.2419	15 13 6.6	12.059
7	1 23 50.21	2.1795	4 23 35.5	15.116	7	3 9 31.20	2.2444	15 25 7.3	11.965
8	1 26 0.98	2.1794	4 38 41.4	15.081	8	3 11 45.94	2.2468	15 37 2.4	11.870
9	1 28 11.74	2.1794	4 53 45.2	15.045	9	3 14 0.83	2.2493	15 48 51.7	11.774
10	1 30 22.51	2.1796	5 8 46.8	15.007	10	3 16 15.86	2.2518	16 0 35.3	11.677
11	1 32 33.29	2.1797	5 23 46.1	14.968	11	3 18 31.04	2.2542	16 12 13.0	11.578
12	1 34 44.08	2.1800	5 38 43.0	14.927	12	3 20 46.37	2.2568	16 23 44.7	11.478
13	1 36 54.89	2.1803	5 53 37.4	14.886	13	3 23 1.86	2.2594	16 35 10.4	11.378
14	1 39 5.72	2.1807	6 8 29.3	14.842	14	3 25 17.50	2.2620	16 46 30.1	11.277
15	1 41 16.57	2.1811	6 23 18.5	14.797	15	3 27 33.30	2.2646	16 57 43.7	11.175
16	1 43 27.45	2.1816	6 38 5.0	14.752	16	3 29 49.25	2.2672	17 8 51.1	11.071
17	1 45 38.36	2.1822	6 52 48.7	14.704	17	3 32 5.36	2.2698	17 19 52.2	10.966
18	1 47 49.31	2.1828	7 7 29.5	14.656	18	3 34 21.63	2.2725	17 30 47.0	10.861
19	1 50 0.30	2.1835	7 22 7.4	14.606	19	3 36 38.06	2.2751	17 41 35.5	10.754
20	1 52 11.33	2.1842	7 36 42.2	14.553	20	3 38 54.64	2.2777	17 52 17.5	10.647
21	1 54 22.41	2.1851	7 51 13.8	14.501	21	3 41 11.39	2.2804	18 2 53.1	10.538
22	1 56 33.54	2.1860	8 5 42.3	14.447	22	3 43 28.29	2.2830	18 13 22.1	10.428
23	1 58 44.73	2.1869	8 20 7.5	14.392	23	3 45 45.35	2.2857	18 23 44.5	10.318
24	2 0 55.97	2.1879	N. 8 34 29.3	14.335	24	3 48 2.58	2.2885	N. 18 34 0.3	10.207

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	MONDAY 9.					WEDNESDAY 11.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	3 48 2.58	2.2885	N.18 34 0.3	10.207	0	5 40 34.86	2.3847	N.24 19 52.5	3.953
1	3 50 19.97	2.2911	18 44 9.4	10.094	1	5 42 57.96	2.3854	24 23 45.4	3.810
2	3 52 37.52	2.2937	18 54 11.6	9.981	2	5 45 21.10	2.3859	24 27 29.7	3.667
3	3 54 55.22	2.2964	19 4 7.0	9.866	3	5 47 44.27	2.3864	24 31 5.5	3.524
4	3 57 13.08	2.2991	19 13 55.5	9.751	4	5 50 7.47	2.3869	24 34 32.7	3.381
5	3 59 31.10	2.3017	19 23 37.1	9.634	5	5 52 30.70	2.3872	24 37 51.2	3.237
6	4 1 49.29	2.3044	19 33 11.7	9.517	6	5 54 53.94	2.3875	24 41 1.1	3.092
7	4 4 7.64	2.3071	19 42 39.2	9.400	7	5 57 17.20	2.3877	24 44 2.3	2.948
8	4 6 26.14	2.3097	19 51 59.6	9.280	8	5 59 40.47	2.3878	24 46 54.9	2.804
9	4 8 44.80	2.3122	20 1 12.8	9.161	9	6 2 3.74	2.3877	24 49 38.8	2.660
10	4 11 3.61	2.3148	20 10 18.9	9.041	10	6 4 27.00	2.3877	24 52 14.1	2.516
11	4 13 22.58	2.3174	20 19 17.7	8.919	11	6 6 50.26	2.3876	24 54 40.7	2.371
12	4 15 41.70	2.3200	20 28 9.2	8.797	12	6 9 13.51	2.3873	24 56 58.6	2.226
13	4 18 0.97	2.3225	20 36 53.3	8.674	13	6 11 36.74	2.3870	24 59 7.8	2.082
14	4 20 20.40	2.3250	20 45 30.0	8.551	14	6 13 59.95	2.3865	25 1 8.4	1.937
15	4 22 39.98	2.3276	20 53 59.3	8.425	15	6 16 23.12	2.3860	25 3 0.3	1.792
16	4 24 59.71	2.3300	21 2 21.1	8.299	16	6 18 46.27	2.3855	25 4 43.5	1.648
17	4 27 19.58	2.3324	21 10 35.3	8.173	17	6 21 9.38	2.3847	25 6 18.1	1.504
18	4 29 39.60	2.3348	21 18 41.9	8.047	18	6 23 32.44	2.3839	25 7 44.0	1.359
19	4 31 59.76	2.3372	21 26 40.9	7.919	19	6 25 55.45	2.3831	25 9 1.2	1.215
20	4 34 20.06	2.3396	21 34 32.2	7.790	20	6 28 18.41	2.3822	25 10 9.8	1.072
21	4 36 40.51	2.3419	21 42 15.7	7.661	21	6 30 41.31	2.3812	25 11 9.8	0.927
22	4 39 1.09	2.3441	21 49 51.5	7.531	22	6 33 4.15	2.3801	25 12 1.1	0.783
23	4 41 21.80	2.3463	N.21 57 19.4	7.400	23	6 35 26.92	2.3788	N.25 12 43.8	0.640
	TUESDAY 10.					THURSDAY 12.			
0	4 43 42.65	2.3486	N.22 4 39.5	7.269	0	6 37 49.61	2.3775	N.25 13 17.9	0.497
1	4 46 3.63	2.3507	22 11 51.7	7.137	1	6 40 12.22	2.3762	25 13 43.4	0.353
2	4 48 24.74	2.3528	22 18 55.9	7.004	2	6 42 34.75	2.3747	25 14 0.3	0.210
3	4 50 45.97	2.3548	22 25 52.2	6.871	3	6 44 57.18	2.3731	25 14 8.6	+0.067
4	4 53 7.32	2.3568	22 32 40.4	6.737	4	6 47 19.52	2.3715	25 14 8.4	−0.075
5	4 55 28.79	2.3588	22 39 20.6	6.602	5	6 49 41.76	2.3697	25 13 59.7	0.217
6	4 57 50.38	2.3607	22 45 52.7	6.467	6	6 52 3.89	2.3679	25 13 42.4	0.358
7	5 0 12.08	2.3626	22 52 16.7	6.332	7	6 54 25.91	2.3660	25 13 16.6	0.500
8	5 2 33.89	2.3643	22 58 32.5	6.196	8	6 56 47.81	2.3640	25 12 42.4	0.641
9	5 4 55.80	2.3661	23 4 40.2	6.059	9	6 59 9.59	2.3620	25 11 59.7	0.782
10	5 7 17.82	2.3678	23 10 39.6	5.921	10	7 1 31.25	2.3598	25 11 8.5	0.922
11	5 9 39.94	2.3695	23 16 30.7	5.783	11	7 3 52.77	2.3575	25 10 9.0	1.062
12	5 12 2.16	2.3711	23 22 13.6	5.646	12	7 6 14.15	2.3552	25 9 1.1	1.201
13	5 14 24.47	2.3726	23 27 48.2	5.507	13	7 8 35.39	2.3527	25 7 44.9	1.340
14	5 16 46.87	2.3740	23 33 14.4	5.367	14	7 10 56.48	2.3502	25 6 20.3	1.479
15	5 19 9.35	2.3753	23 38 32.2	5.227	15	7 13 17.42	2.3477	25 4 47.4	1.617
16	5 21 31.91	2.3767	23 43 41.7	5.087	16	7 15 38.20	2.3450	25 3 6.3	1.754
17	5 23 54.55	2.3780	23 48 42.8	4.947	17	7 17 58.82	2.3422	25 1 16.9	1.891
18	5 26 17.26	2.3792	23 53 35.4	4.806	18	7 20 19.27	2.3394	24 59 19.4	2.027
19	5 28 40.04	2.3803	23 58 19.5	4.665	19	7 22 39.55	2.3366	24 57 13.7	2.163
20	5 31 2.89	2.3813	24 2 55.2	4.523	20	7 24 59.66	2.3337	24 54 59.8	2.298
21	5 33 25.80	2.3823	24 7 22.3	4.381	21	7 27 19.59	2.3306	24 52 37.9	2.432
22	5 35 48.77	2.3832	24 11 40.9	4.239	22	7 29 39.33	2.3274	24 50 7.9	2.567
23	5 38 11.79	2.3840	24 15 51.0	4.096	23	7 31 58.88	2.3242	24 47 29.8	2.701
24	5 40 34.86	2.3847	N.24 19 52.5	3.953	24	7 34 18.23	2.3209	N.24 44 43.8	2.833

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	FRIDAY 13.					SUNDAY 15.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	7 34 18.23	2.3209	N.24 44 43.8	2.833	0	9 20 55.32	2.1082	N.20 10 43.7	8.236
1	7 36 37.39	2.3176	24 41 49.8	2.966	1	9 23 1.66	2.1032	20 2 26.9	8.325
2	7 38 56.34	2.3142	24 38 47.9	3.097	2	9 25 7.70	2.0982	19 54 4.7	8.413
3	7 41 15.09	2.3107	24 35 38.1	3.228	3	9 27 13.45	2.0933	19 45 37.3	8.500
4	7 43 33.62	2.3071	24 32 20.5	3.358	4	9 29 18.90	2.0883	19 37 4.7	8.587
5	7 45 51.94	2.3036	24 28 55.1	3.487	5	9 31 24.05	2.0834	19 28 26.9	8.672
6	7 48 10.05	2.2999	24 25 22.0	3.616	6	9 33 28.91	2.0786	19 19 44.0	8.757
7	7 50 27.93	2.2962	24 21 41.2	3.744	7	9 35 33.48	2.0737	19 10 56.1	8.839
8	7 52 45.59	2.2924	24 17 52.7	3.872	8	9 37 37.75	2.0687	19 2 3.3	8.921
9	7 55 3.02	2.2885	24 13 56.6	3.998	9	9 39 41.72	2.0637	18 53 5.6	9.002
10	7 57 20.21	2.2846	24 9 52.9	4.123	10	9 41 45.40	2.0589	18 44 3.0	9.083
11	7 59 37.17	2.2807	24 5 41.8	4.248	11	9 43 48.79	2.0541	18 34 55.6	9.162
12	8 1 53.89	2.2766	24 1 23.1	4.373	12	9 45 51.89	2.0492	18 25 43.5	9.240
13	8 4 10.36	2.2725	23 56 57.0	4.496	13	9 47 54.70	2.0444	18 16 26.8	9.317
14	8 6 26.59	2.2684	23 52 23.6	4.618	14	9 49 57.22	2.0396	18 7 5.5	9.393
15	8 8 42.57	2.2642	23 47 42.8	4.740	15	9 51 59.45	2.0348	17 57 39.6	9.468
16	8 10 58.30	2.2600	23 42 54.8	4.861	16	9 54 1.40	2.0301	17 48 9.3	9.542
17	8 13 13.77	2.2557	23 37 59.5	4.982	17	9 56 3.06	2.0253	17 38 34.5	9.616
18	8 15 28.98	2.2513	23 32 57.0	5.101	18	9 58 4.44	2.0206	17 28 55.4	9.687
19	8 17 43.93	2.2470	23 27 47.4	5.218	19	10 0 5.53	2.0158	17 19 12.0	9.759
20	8 19 58.62	2.2426	23 22 30.8	5.335	20	10 2 6.34	2.0112	17 9 24.3	9.830
21	8 22 13.04	2.2381	23 17 7.2	5.452	21	10 4 6.87	2.0066	16 59 32.4	9.899
22	8 24 27.19	2.2336	23 11 36.6	5.567	22	10 6 7.13	2.0020	16 49 36.4	9.967
23	8 26 41.07	2.2291	N.23 5 59.1	5.682	23	10 8 7.11	1.9974	N.16 39 36.4	10.033
	SATURDAY 14.					MONDAY 16.			
0	8 28 54.68	2.2245	N.23 0 14.7	5.796	0	10 10 6.82	1.9928	N.16 29 32.4	10.100
1	8 31 8.01	2.2199	22 54 23.6	5.908	1	10 12 6.25	1.9883	16 19 24.4	10.165
2	8 33 21.07	2.2153	22 48 25.7	6.021	2	10 14 5.42	1.9838	16 9 12.6	10.229
3	8 35 33.85	2.2107	22 42 21.1	6.132	3	10 16 4.32	1.9793	15 58 56.9	10.293
4	8 37 46.35	2.2059	22 36 9.9	6.242	4	10 18 2.95	1.9750	15 48 37.4	10.356
5	8 39 58.56	2.2012	22 29 52.1	6.351	5	10 20 1.31	1.9706	15 38 14.2	10.417
6	8 42 10.49	2.1965	22 23 27.8	6.458	6	10 21 59.41	1.9662	15 27 47.4	10.477
7	8 44 22.14	2.1917	22 16 57.1	6.565	7	10 23 57.25	1.9618	15 17 17.0	10.537
8	8 46 33.50	2.1869	22 10 20.0	6.672	8	10 25 54.83	1.9576	15 6 43.0	10.596
9	8 48 44.57	2.1820	22 3 36.5	6.777	9	10 27 52.16	1.9533	14 56 5.5	10.653
10	8 50 55.34	2.1772	21 56 46.7	6.882	10	10 29 49.24	1.9492	14 45 24.6	10.709
11	8 53 5.83	2.1724	21 49 50.7	6.984	11	10 31 46.06	1.9450	14 34 40.4	10.765
12	8 55 16.03	2.1675	21 42 48.6	7.086	12	10 33 42.63	1.9408	14 23 52.8	10.821
13	8 57 25.93	2.1626	21 35 40.4	7.187	13	10 35 38.96	1.9367	14 13 1.9	10.874
14	8 59 35.54	2.1577	21 28 26.1	7.288	14	10 37 35.04	1.9327	14 2 7.9	10.927
15	9 1 44.85	2.1527	21 21 5.8	7.387	15	10 39 30.88	1.9287	13 51 10.7	10.980
16	9 3 53.87	2.1478	21 13 39.6	7.486	16	10 41 26.48	1.9247	13 40 10.4	11.031
17	9 6 2.59	2.1429	21 6 7.5	7.583	17	10 43 21.85	1.9208	13 29 7.0	11.081
18	9 8 11.02	2.1379	20 58 29.6	7.680	18	10 45 16.98	1.9169	13 18 0.6	11.131
19	9 10 19.14	2.1329	20 50 45.9	7.775	19	10 47 11.88	1.9131	13 6 51.3	11.179
20	9 12 26.97	2.1281	20 42 56.6	7.868	20	10 49 6.55	1.9093	12 55 39.1	11.227
21	9 14 34.50	2.1231	20 35 1.7	7.962	21	10 51 1.00	1.9057	12 44 24.1	11.272
22	9 16 41.74	2.1181	20 27 1.2	8.054	22	10 52 55.23	1.9019	12 33 6.4	11.318
23	9 18 48.68	2.1132	20 18 55.2	8.146	23	10 54 49.23	1.8982	12 21 45.9	11.364
24	9 20 55.32	2.1082	N.20 10 43.7	8.236	24	10 56 43.02	1.8947	N.12 10 22.7	11.408

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	TUESDAY 17.					THURSDAY 19.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	10 56 43.02	1.8947	N. 12 10 22.7	11.408	0	12 24 30.65	1.7852	N. 2 27 26.7	12.588
1	10 58 36.59	1.8911	11 58 56.9	11.451	1	12 26 17.74	1.7843	2 14 51.2	12.595
2	11 0 29.95	1.8876	11 47 28.6	11.493	2	12 28 4.77	1.7835	2 2 15.3	12.602
3	11 2 23.10	1.8841	11 35 57.7	11.535	3	12 29 51.76	1.7828	1 49 39.0	12.607
4	11 4 16.04	1.8807	11 24 24.4	11.576	4	12 31 38.71	1.7822	1 37 2.4	12.612
5	11 6 8.78	1.8773	11 12 48.6	11.616	5	12 33 25.62	1.7816	1 24 25.6	12.616
6	11 8 1.32	1.8741	11 1 10.5	11.654	6	12 35 12.50	1.7811	1 11 48.5	12.619
7	11 9 53.67	1.8708	10 49 30.1	11.692	7	12 36 59.35	1.7806	0 59 11.3	12.622
8	11 11 45.82	1.8676	10 37 47.4	11.730	8	12 38 46.17	1.7802	0 46 33.9	12.624
9	11 13 37.78	1.8644	10 26 2.5	11.766	9	12 40 32.97	1.7798	0 33 56.4	12.625
10	11 15 29.55	1.8613	10 14 15.5	11.802	10	12 42 19.75	1.7795	0 21 18.9	12.626
11	11 17 21.14	1.8582	10 2 26.3	11.837	11	12 44 6.51	1.7792	N. 0 8 41.3	12.627
12	11 19 12.54	1.8552	9 50 35.1	11.871	12	12 45 53.26	1.7792	S. 0 3 56.3	12.626
13	11 21 3.77	1.8523	9 38 41.8	11.904	13	12 47 40.01	1.7791	0 16 33.8	12.624
14	11 22 54.82	1.8494	9 26 46.6	11.936	14	12 49 26.75	1.7790	0 29 11.2	12.622
15	11 24 45.70	1.8467	9 14 49.5	11.967	15	12 51 13.49	1.7791	0 41 48.5	12.620
16	11 26 36.42	1.8439	9 2 50.5	11.999	16	12 53 0.24	1.7792	0 54 25.6	12.617
17	11 28 26.97	1.8411	8 50 49.6	12.029	17	12 54 46.99	1.7792	1 7 2.5	12.613
18	11 30 17.35	1.8384	8 38 47.0	12.058	18	12 56 33.75	1.7795	1 19 39.2	12.609
19	11 32 7.58	1.8359	8 26 42.6	12.087	19	12 58 20.53	1.7798	1 32 15.6	12.603
20	11 33 57.66	1.8333	8 14 36.6	12.114	20	13 0 7.33	1.7802	1 44 51.6	12.597
21	11 35 47.58	1.8307	8 2 28.9	12.142	21	13 1 54.15	1.7806	1 57 27.2	12.591
22	11 37 37.35	1.8283	7 50 19.6	12.167	22	13 3 41.00	1.7811	2 10 2.5	12.584
23	11 39 26.98	1.8260	N. 7 38 8.8	12.192	23	13 5 27.88	1.7816	S. 2 22 37.3	12.576
	WEDNESDAY 18.					FRIDAY 20.			
0	11 41 16.47	1.8237	N. 7 25 56.5	12.217	0	13 7 14.79	1.7822	S. 2 35 11.6	12.567
1	11 43 5.82	1.8213	7 13 42.7	12.241	1	13 9 1.74	1.7829	2 47 45.4	12.558
2	11 44 55.03	1.8191	7 1 27.6	12.263	2	13 10 48.74	1.7837	3 0 18.6	12.549
3	11 46 44.11	1.8169	6 49 11.1	12.287	3	13 12 35.78	1.7844	3 12 51.3	12.539
4	11 48 33.06	1.8148	6 36 53.2	12.308	4	13 14 22.87	1.7852	3 25 23.3	12.527
5	11 50 21.89	1.8127	6 24 34.1	12.329	5	13 16 10.01	1.7862	3 37 54.6	12.516
6	11 52 10.59	1.8107	6 12 13.7	12.349	6	13 17 57.21	1.7872	3 50 25.2	12.503
7	11 53 59.18	1.8088	5 59 52.2	12.368	7	13 19 44.47	1.7882	4 2 55.0	12.491
8	11 55 47.65	1.8070	5 47 29.5	12.387	8	13 21 31.80	1.7893	4 15 24.1	12.477
9	11 57 36.02	1.8052	5 35 5.7	12.405	9	13 23 19.19	1.7905	4 27 52.3	12.462
10	11 59 24.28	1.8034	5 22 40.9	12.422	10	13 25 6.66	1.7917	4 40 19.6	12.447
11	12 1 12.43	1.8017	5 10 15.1	12.438	11	13 26 54.20	1.7931	4 52 46.0	12.432
12	12 3 0.48	1.8001	4 57 48.3	12.454	12	13 28 41.83	1.7945	5 5 11.5	12.417
13	12 4 48.44	1.7985	4 45 20.6	12.469	13	13 30 29.54	1.7959	5 17 36.0	12.399
14	12 6 36.30	1.7970	4 32 52.0	12.484	14	13 32 17.34	1.7975	5 29 59.4	12.382
15	12 8 24.08	1.7956	4 20 22.5	12.497	15	13 34 5.24	1.7991	5 42 21.8	12.364
16	12 10 11.77	1.7942	4 7 52.3	12.510	16	13 35 53.23	1.8007	5 54 43.1	12.345
17	12 11 59.38	1.7928	3 55 21.3	12.522	17	13 37 41.32	1.8023	6 7 3.2	12.326
18	12 13 46.91	1.7915	3 42 49.6	12.534	18	13 39 29.51	1.8041	6 19 22.2	12.306
19	12 15 34.36	1.7903	3 30 17.2	12.545	19	13 41 17.81	1.8059	6 31 39.9	12.284
20	12 17 21.75	1.7892	3 17 44.2	12.555	20	13 43 6.22	1.8078	6 43 56.3	12.262
21	12 19 9.07	1.7881	3 5 10.6	12.564	21	13 44 54.75	1.8098	6 56 11.4	12.241
22	12 20 56.32	1.7870	2 52 36.5	12.573	22	13 46 43.40	1.8118	7 8 25.2	12.218
23	12 22 43.51	1.7861	2 40 1.8	12.582	23	13 48 32.17	1.8139	7 20 37.6	12.194
24	12 24 30.65	1.7852	N. 2 27 26.7	12.588	24	13 50 21.07	1.8161	S. 7 32 48.5	12.170

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	SATURDAY 21.					MONDAY 23.			
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	13 50 21.07	1.8161	S. 7 32 48.5	12.170	0	15 21 13.15	1.9936	S. 16 35 4.8	10.119
1	13 52 10.10	1.8183	7 44 58.0	12.145	1	15 23 12.92	1.9987	16 45 10.0	10.056
2	13 53 59.27	1.8206	7 57 5.9	12.119	2	15 25 13.00	2.0039	16 55 11.4	9.991
3	13 55 48.57	1.8229	8 9 12.3	12.093	3	15 27 13.39	2.0091	17 5 8.9	9.926
4	13 57 38.02	1.8254	8 21 17.1	12.066	4	15 29 14.09	2.0143	17 15 2.5	9.859
5	13 59 27.62	1.8279	8 33 20.2	12.038	5	15 31 15.11	2.0197	17 24 52.0	9.792
6	14 1 17.37	1.8304	8 45 21.7	12.010	6	15 33 16.46	2.0252	17 34 37.5	9.724
7	14 3 7.27	1.8329	8 57 21.4	11.980	7	15 35 18.13	2.0305	17 44 18.9	9.655
8	14 4 57.32	1.8356	9 9 19.3	11.951	8	15 37 20.12	2.0360	17 53 56.1	9.585
9	14 6 47.54	1.8384	9 21 15.5	11.921	9	15 39 22.44	2.0415	18 3 29.1	9.514
10	14 8 37.93	1.8412	9 33 9.8	11.889	10	15 41 25.10	2.0470	18 12 57.8	9.442
11	14 10 28.49	1.8441	9 45 2.2	11.857	11	15 43 28.09	2.0527	18 22 22.1	9.367
12	14 12 19.22	1.8470	9 56 52.6	11.824	12	15 45 31.42	2.0582	18 31 41.9	9.293
13	14 14 10.13	1.8500	10 8 41.1	11.791	13	15 47 35.08	2.0639	18 40 57.3	9.218
14	14 16 1.22	1.8531	10 20 27.5	11.756	14	15 49 39.09	2.0697	18 50 8.1	9.142
15	14 17 52.50	1.8562	10 32 11.8	11.721	15	15 51 43.45	2.0755	18 59 14.3	9.064
16	14 19 43.97	1.8594	10 43 54.0	11.686	16	15 53 48.15	2.0812	19 8 15.8	8.986
17	14 21 35.63	1.8627	10 55 34.1	11.650	17	15 55 53.20	2.0871	19 17 12.6	8.907
18	14 23 27.49	1.8660	11 7 12.0	11.612	18	15 57 58.60	2.0929	19 26 4.6	8.826
19	14 25 19.55	1.8693	11 18 47.6	11.574	19	16 0 4.35	2.0988	19 34 51.7	8.744
20	14 27 11.81	1.8727	11 30 20.9	11.536	20	16 2 10.46	2.1047	19 43 33.9	8.662
21	14 29 4.28	1.8762	11 41 51.9	11.497	21	16 4 16.93	2.1107	19 52 11.1	8.578
22	14 30 56.96	1.8798	11 53 20.5	11.456	22	16 6 23.75	2.1167	20 0 43.3	8.493
23	14 32 49.86	1.8835	S. 12 4 46.6	11.414	23	16 8 30.93	2.1227	S. 20 9 10.3	8.407
	SUNDAY 22.					TUESDAY 24.			
0	14 34 42.98	1.8872	S. 12 16 10.2	11.372	0	16 10 38.48	2.1288	S. 20 17 32.1	8.320
1	14 36 36.32	1.8909	12 27 31.3	11.330	1	16 12 46.39	2.1349	20 25 48.7	8.232
2	14 38 29.89	1.8947	12 38 49.9	11.287	2	16 14 54.67	2.1410	20 33 59.9	8.142
3	14 40 23.69	1.8987	12 50 5.8	11.242	3	16 17 3.31	2.1471	20 42 5.7	8.052
4	14 42 17.73	1.9026	13 1 19.0	11.197	4	16 19 12.32	2.1533	20 50 6.1	7.960
5	14 44 12.00	1.9065	13 12 29.5	11.152	5	16 21 21.70	2.1595	20 58 0.9	7.867
6	14 46 6.51	1.9106	13 23 37.3	11.106	6	16 23 31.46	2 1657	21 5 50.1	7.773
7	14 48 1.27	1.9147	13 34 42.2	11.058	7	16 25 41.59	2.1719	21 13 33.7	7.678
8	14 49 56.28	1.9189	13 45 44.3	11.010	8	16 27 52.09	2.1781	21 21 11.5	7.582
9	14 51 51.54	1.9232	13 56 43.5	10.961	9	16 30 2.96	2.1843	21 28 43.5	7.485
10	14 53 47.06	1.9275	14 7 39.6	10.911	10	16 32 14.21	2.1906	21 36 9.7	7.387
11	14 55 42.84	1.9318	14 18 32.7	10.860	11	16 34 25.83	2.1968	21 43 29.9	7.287
12	14 57 38.88	1.9362	14 29 22.8	10.808	12	16 36 37.83	2.2032	21 50 44.1	7.186
13	14 59 35.19	1.9407	14 40 9.7	10.756	13	16 38 50.21	2.2094	21 57 52.2	7.084
14	15 1 31.77	1.9452	14 50 53.5	10.702	14	16 41 2.96	2.2157	22 4 54.2	6.982
15	15 3 28.62	1.9498	15 1 34.0	10.648	15	16 43 16.09	2.2219	22 11 50.0	6.877
16	15 5 25.75	1.9545	15 12 11.3	10.593	16	16 45 29.60	2.2282	22 18 39.4	6.771
17	15 7 23.16	1.9592	15 22 45.2	10.537	17	16 47 43.48	2.2346	22 25 22.5	6.664
18	15 9 20.85	1.9639	15 33 15.7	10.480	18	16 49 57.74	2.2408	22 31 59.1	6.557
19	15 11 18.83	1.9687	15 43 42.8	10.422	19	16 52 12.38	2.2472	22 38 29.3	6.448
20	15 13 17.10	1.9737	15 54 6.4	10.364	20	16 54 27.40	2.2534	22 44 52.9	6.337
21	15 15 15.67	1.9786	16 4 26.5	10.304	21	16 56 42.79	2.2597	22 51 9.8	6.226
22	15 17 14.53	1.9835	16 14 43.0	10.243	22	16 58 58.56	2.2660	22 57 20.0	6.113
23	15 19 13.69	1.9885	16 24 55.8	10.182	23	17 1 14.71	2.2722	23 3 23.4	6.000
24	15 21 13.15	1.9936	S. 16 35 4.8	10.119	24	17 3 31.23	2.2785	S. 23 9 20.0	386

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	WEDNESDAY 25.					FRIDAY 27.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	17 3 31.23	2.2785	S. 23 9 20.0	5.886	0	18 59 17.27	2.5190	S. 25 18 12.2	0.896
1	17 5 48.12	2.2847	23 15 9.7	5.769	1	19 1 48.50	2.5219	25 17 13.6	1.058
2	17 8 5.39	2.2908	23 20 52.3	5.652	2	19 4 19.90	2.5247	25 16 5.2	1.222
3	17 10 23.03	2.2970	23 26 27.9	5.533	3	19 6 51.46	2.5273	25 14 47.0	1.385
4	17 12 41.04	2.3032	23 31 56.3	5.413	4	19 9 23.18	2.5300	25 13 19.0	1.549
5	17 14 59.42	2.3094	23 37 17.5	5.293	5	19 11 55.06	2.5325	25 11 41.1	1.713
6	17 17 18.17	2.3155	23 42 31.4	5.172	6	19 14 27.08	2.5348	25 9 53.4	1.877
7	17 19 37.28	2.3216	23 47 38.0	5.047	7	19 16 59.24	2.5371	25 7 55.8	2.042
8	17 21 56.76	2.3277	23 52 37.2	4.923	8	19 19 31.53	2.5392	25 5 48.3	2.207
9	17 24 16.60	2.3337	23 57 28.9	4.798	9	19 22 3.95	2.5413	25 3 30.9	2.373
10	17 26 36.80	2.3397	24 2 13.0	4.672	10	19 24 36.49	2.5432	25 1 3.5	2.540
11	17 28 57.36	2.3456	24 6 49.5	4.543	11	19 27 9.13	2.5449	24 58 26.1	2.706
12	17 31 18.27	2.3515	24 11 18.2	4.414	12	19 29 41.88	2.5466	24 55 38.8	2.872
13	17 33 39.54	2.3574	24 15 39.2	4.285	13	19 32 14.72	2.5481	24 52 41.5	3.038
14	17 36 1.16	2.3632	24 19 52.4	4.153	14	19 34 47.65	2.5495	24 49 34.2	3.205
15	17 38 23.12	2.3689	24 23 57.6	4.021	15	19 37 20.66	2.5507	24 46 16.9	3.372
16	17 40 45.43	2.3747	24 27 54.9	3.887	16	19 39 53.74	2.5519	24 42 49.5	3.540
17	17 43 8.09	2.3804	24 31 44.2	3.753	17	19 42 26.89	2.5530	24 39 12.1	3.707
18	17 45 31.08	2.3859	24 35 25.3	3.617	18	19 45 0.10	2.5539	24 35 24.7	3.873
19	17 47 54.40	2.3915	24 38 58.2	3.480	19	19 47 33.36	2.5547	24 31 27.3	4.041
20	17 50 18.06	2.3971	24 42 22.9	3.342	20	19 50 6.67	2.5554	24 27 19.8	4.208
21	17 52 42.05	2.4025	24 45 39.3	3.204	21	19 52 40.01	2.5560	24 23 2.3	4.376
22	17 55 6.36	2.4078	24 48 47.4	3.064	22	19 55 13.39	2.5565	24 18 34.7	4.543
23	17 57 30.99	2.4132	S. 24 51 47.0	2.923	23	19 57 46.79	2.5568	S. 24 13 57.1	4.710
	THURSDAY 26.					SATURDAY 28.			
0	17 59 55.94	2.4184	S. 24 54 38.2	2.782	0	20 0 20.21	2.5571	S. 24 9 9.5	4.877
1	18 2 21.20	2.4236	24 57 20.8	2.638	1	20 2 53.64	2.5572	24 4 11.9	5.042
2	18 4 46.77	2.4287	24 59 54.8	2.494	2	20 5 27.07	2.5571	23 59 4.4	5.208
3	18 7 12.64	2.4337	25 2 20.1	2.348	3	20 8 0.49	2.5569	23 53 46.9	5.375
4	18 9 38.82	2.4387	25 4 36.6	2.203	4	20 10 33.90	2.5567	23 48 19.4	5.541
5	18 12 5.29	2.4436	25 6 44.4	2.057	5	20 13 7.30	2.5564	23 42 42.0	5.706
6	18 14 32.05	2.4483	25 8 43.4	1.908	6	20 15 40.67	2.5559	23 36 54.7	5.871
7	18 16 59.09	2.4531	25 10 33.5	1.759	7	20 18 14.01	2.5553	23 30 57.5	6.036
8	18 19 26.42	2.4577	25 12 14.5	1.609	8	20 20 47.31	2.5547	23 24 50.4	6.200
9	18 21 54.02	2.4622	25 13 46.5	1.458	9	20 23 20.57	2.5539	23 18 33.5	6.363
10	18 24 21.89	2.4667	25 15 9.5	1.307	10	20 25 53.78	2.5530	23 12 6.8	6.527
11	18 26 50.03	2.4711	25 16 23.4	1.155	11	20 28 26.93	2.5520	23 5 30.3	6.690
12	18 29 18.42	2.4753	25 17 28.1	1.002	12	20 31 0.02	2.5509	22 58 44.0	6.852
13	18 31 47.07	2.4796	25 18 23.6	0.847	13	20 33 33.04	2.5497	22 51 48.0	7.013
14	18 34 15.97	2.4837	25 19 9.8	0.692	14	20 36 5.98	2.5483	22 44 42.4	7.174
15	18 36 45.11	2.4876	25 19 46.7	0.537	15	20 38 38.84	2.5469	22 37 27.1	7.335
16	18 39 14.48	2.4915	25 20 14.3	0.381	16	20 41 11.61	2.5454	22 30 2.2	7.495
17	18 41 44.09	2.4953	25 20 32.4	0.223	17	20 43 44.29	2.5438	22 22 27.7	7.654
18	18 44 13.92	2.4990	25 20 41.1	−0.065	18	20 46 16.87	2.5421	22 14 43.7	7.812
19	18 46 43.97	2.5026	25 20 40.2	+0.094	19	20 48 49.34	2.5403	22 6 50.3	7.969
20	18 49 14.23	2.5061	25 20 29.8	0.252	20	20 51 21.71	2.5385	21 58 47.4	8.126
21	18 51 44.70	2.5094	25 20 9.9	0.412	21	20 53 53.96	2.5365	21 50 35.2	8.282
22	18 54 15.36	2.5127	25 19 40.3	0.573	22	20 56 26.09	2.5345	21 42 13.6	8.437
23	18 56 46.22	2.5159	25 19 1.1	0.734	23	20 58 58.10	2.5323	21 33 42.8	8.590
24	18 59 17.27	2.5190	S. 25 18 12.2	0.896	24	21 1 29.97	2.5301	S. 21 25 2.8	8.743

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

SUNDAY 29.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	21 1 29.97	2.5301	S. 21 25 2.8	8.743
1	21 4 1.71	2.5278	21 16 13.6	8.895
2	21 6 33.31	2.5254	21 7 15.4	9.046
3	21 9 4.76	2.5230	20 58 8.1	9.196
4	21 11 36.07	2.5205	20 48 51.9	9.345
5	21 14 7.22	2.5178	20 39 26.7	9.493
6	21 16 38.21	2.5152	20 29 52.7	9.639
7	21 19 9.05	2.5126	20 20 10.0	9.785
8	21 21 39.72	2.5097	20 10 18.5	9.930
9	21 24 10.22	2.5069	20 0 18.4	10.072
10	21 26 40.55	2.5040	19 50 9.8	10.214
11	21 29 10.70	2.5010	19 39 52.7	10.356
12	21 31 40.67	2.4980	19 29 27.1	10.496
13	21 34 10.46	2.4949	19 18 53.2	10.633
14	21 36 40.06	2.4918	19 8 11.1	10.769
15	21 39 9.47	2.4887	18 57 20.8	10.905
16	21 41 38.69	2.4853	18 46 22.5	11.039
17	21 44 7.72	2.4821	18 35 16.2	11.172
18	21 46 36.55	2.4789	18 24 1.9	11.303
19	21 49 5.18	2.4756	18 12 39.8	11.432
20	21 51 33.61	2.4721	18 1 10.0	11.561
21	21 54 1.84	2.4687	17 49 32.5	11.688
22	21 56 29.86	2.4653	17 37 47.4	11.814
23	21 58 57.68	2.4619	S. 17 25 54.8	11.937

MONDAY 30.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	22 1 25.29	2.4584	S. 17 13 54.9	12.059
1	22 3 52.69	2.4549	17 1 47.7	12.180
2	22 6 19.88	2.4514	16 49 33.3	12.299
3	22 8 46.86	2.4478	16 37 11.8	12.417
4	22 11 13.62	2.4442	16 24 43.3	12.532
5	22 13 40.17	2.4407	16 12 7.9	12.647
6	22 16 6.50	2.4371	15 59 25.7	12.759
7	22 18 32.62	2.4335	15 46 36.8	12.870
8	22 20 58.52	2.4298	15 33 41.3	12.980
9	22 23 24.20	2.4262	15 20 39.2	13.087
10	22 25 49.67	2.4227	15 7 30.8	13.192
11	22 28 14.92	2.4190	14 54 16.1	13.297
12	22 30 39.95	2.4153	14 40 55.2	13.399
13	22 33 4.76	2.4117	14 27 28.2	13.499
14	22 35 29.36	2.4082	14 13 55.3	13.597
15	22 37 53.74	2.4046	14 0 16.5	13.695
16	22 40 17.91	2.4010	13 46 31.9	13.790
17	22 42 41.86	2.3974	13 32 41.7	13.883
18	22 45 5.60	2.3938	13 18 45.9	13.976
19	22 47 29.12	2.3902	13 4 44.7	14.065
20	22 49 52.43	2.3867	12 50 38.1	14.152
21	22 52 15.53	2.3832	12 36 26.3	14.239
22	22 54 38.41	2.3797	12 22 9.4	14.322
23	22 57 1.09	2.3762	12 7 47.5	14.405
24	22 59 23.56	2.3728	S. 11 53 20.8	14.486

TUESDAY 31.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	22 59 23.56	2.3728	S. 11 53 20.8	14.486
1	23 1 45.83	2.3694	11 38 49.3	14.564
2	23 4 7.89	2.3660	11 24 13.1	14.641
3	23 6 29.75	2.3626	11 9 32.4	14.715
4	23 8 51.40	2.3592	10 54 47.3	14.788
5	23 11 12.86	2.3560	10 39 57.8	14.860
6	23 13 34.12	2.3527	10 25 4.1	14.928
7	23 15 55.18	2.3494	10 10 6.4	14.995
8	23 18 16.05	2.3463	9 55 4.7	15.061
9	23 20 36.74	2.3432	9 39 59.1	15.124
10	23 22 57.23	2.3399	9 24 49.8	15.185
11	23 25 17.53	2.3368	9 9 36.9	15.245
12	23 27 37.65	2.3338	8 54 20.4	15.302
13	23 29 57.59	2.3308	8 39 0.6	15.357
14	23 32 17.35	2.3278	8 23 37.5	15.411
15	23 34 36.93	2.3248	8 8 11.3	15.463
16	23 36 56.33	2.3220	7 52 42.0	15.512
17	23 39 15.57	2.3192	7 37 9.8	15.560
18	23 41 34.64	2.3164	7 21 34.8	15.606
19	23 43 53.54	2.3137	7 5 57.1	15.650
20	23 46 12.28	2.3110	6 50 16.8	15.692
21	23 48 30.86	2.3083	6 34 34.1	15.731
22	23 50 49.28	2.3057	6 18 49.1	15.769
23	23 53 7.55	2.3032	S. 6 3 1.8	15.806

WEDNESDAY, SEPTEMBER 1.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	23 55 25.67	2.3008	S. 5 47 12.4	15.840

PHASES OF THE MOON.

			d	h	m
○	Full Moon	Aug.	1	9	14.0
☾	Last Quarter		8	0	9.9
●	New Moon		15	11	54.7
☽	First Quarter		23	15	55.3
○	Full Moon		30	17	7.8

			d	h
☾	Perigee	Aug.	3	16.0
☾	Apogee		19	10.7
☾	Perigee		31	19.3

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	III^h	P. L. of Diff.	VI^h	P. L. of Diff.	IX^h	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
1	Spica	W.	100 37 44	2243	102 25 7	2233	104 12 46	2223	106 0 39	2214
	Antares	W.	54 43 12	2243	56 30 35	2232	58 18 15	2221	60 6 12	2210
	Mars	E.	60 7 13	2300	58 21 14	2289	56 34 59	2279	54 48 28	2269
	Saturn	E.	79 42 12	2221	77 54 16	2210	76 6 4	2200	74 17 36	2190
	α Arietis	E.	93 37 36	2334	91 52 26	2322	90 6 59	2312	88 21 17	2302
2	Antares	W.	69 9 33	2167	70 58 50	2160	72 48 18	2154	74 37 55	2149
	Mars	E.	45 52 24	2226	44 4 35	2219	42 16 36	2213	40 28 27	2207
	Saturn	E.	65 11 56	2151	63 22 13	2145	61 32 22	2139	59 42 21	2133
	α Arietis	E.	79 29 42	2267	77 42 54	2262	75 55 59	2259	74 8 59	2256
	Aldebaran	E.	109 59 17	2165	108 9 57	2158	106 20 26	2152	104 30 46	2146
3	Antares	W.	83 47 44	2130	85 37 57	2129	87 28 12	2128	89 18 29	2127
	α Aquilæ	W.	46 7 1	3873	47 20 48	3768	48 36 24	3673	49 53 40	3588
	Mars	E.	31 25 55	2188	29 37 9	2186	27 48 20	2184	25 59 28	2183
	Saturn	E.	50 30 36	2116	48 40 1	2115	46 49 24	2114	44 58 46	2113
	α Arietis	E.	65 13 20	2256	63 26 14	2258	61 39 13	2262	59 52 18	2268
	Aldebaran	E.	95 20 41	2129	93 30 26	2127	91 40 8	2126	89 49 48	2126
4	Antares	W.	98 29 49	2134	100 19 57	2136	102 10 1	2139	104 0 0	2143
	α Aquilæ	W.	56 40 17	3281	58 4 51	3237	59 30 17	3198	60 56 29	3164
	Saturn	E.	35 45 42	2120	33 55 13	2123	32 4 49	2126	30 14 30	2130
	α Arietis	E.	51 0 17	2314	49 14 38	2328	47 29 19	2344	45 44 23	2362
	Aldebaran	E.	80 38 17	2132	78 48 6	2135	76 58 0	2138	75 7 59	2142
5	α Aquilæ	W.	68 16 15	3046	69 45 30	3031	71 15 4	3019	72 44 53	3009
	Aldebaran	E.	65 59 40	2170	64 10 27	2177	62 21 24	2184	60 32 32	2192
	Sun	E.	129 59 35	2464	128 17 33	2470	126 35 38	2477	124 53 52	2484
6	α Aquilæ	W.	80 16 7	2992	81 46 30	2993	83 16 51	2996	84 47 9	3001
	Fomalhaut	W.	46 4 12	2551	47 44 14	2540	49 24 31	2532	51 4 59	2527
	Mars	W.	11 52 21	2277	13 38 55	2285	15 25 16	2294	17 11 24	2303
	Aldebaran	E.	51 31 21	2237	49 43 48	2248	47 56 32	2258	46 9 31	2269
	Sun	E.	116 27 38	2525	114 46 59	2534	113 6 32	2543	111 26 18	2553
7	α Aquilæ	W.	92 16 24	3048	93 45 37	3062	95 14 34	3077	96 43 12	3093
	Fomalhaut	W.	59 28 28	2522	61 9 11	2525	62 49 50	2528	64 30 25	2532
	α Pegasi	W.	44 35 23	3188	46 1 47	3144	47 29 3	3108	48 57 3	3077
	Mars	W.	25 58 42	2351	27 43 27	2361	29 27 58	2371	31 12 15	2381
	Aldebaran	E.	37 18 46	2333	35 33 34	2347	33 48 43	2362	32 4 14	2378
	Sun	E.	103 8 39	2605	101 29 51	2616	99 51 18	2627	98 13 0	2638
8	Fomalhaut	W.	72 51 32	2563	74 31 18	2570	76 10 54	2578	77 50 19	2587
	α Pegasi	W.	56 25 2	2976	57 55 45	2965	59 26 42	2955	60 57 52	2947
	Mars	W.	39 49 56	2433	41 32 43	2443	43 15 16	2454	44 57 34	2464
	Saturn	W.	21 56 3	2379	23 40 8	2389	25 23 59	2399	27 7 36	2409
	Sun	E.	90 5 21	2696	88 28 36	2708	86 52 7	2720	85 15 54	2732
9	Fomalhaut	W.	86 4 19	2635	87 42 27	2645	89 20 21	2655	90 58 1	2666
	α Pegasi	W.	68 35 23	2932	70 7 1	2932	71 38 39	2934	73 10 15	2936
	Mars	W.	53 25 20	2517	55 6 9	2528	56 46 43	2538	58 27 4	2548
	Saturn	W.	35 42 1	2460	37 24 10	2471	39 6 4	2481	40 47 44	2491

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh	P. L. of Diff.	XVIIIh	P. L. of Diff.	XXIh	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
1	Spica	W.	107 48 45	2205	109 37 4	2197	111 25 36	2190	113 14 18	2184
	Antares	W.	61 54 25	2200	63 42 52	2191	65 31 33	2182	67 20 27	2174
	Mars	E.	53 1 42	2259	51 14 42	2250	49 27 28	2241	47 40 2	2233
	Saturn	E.	72 28 54	2181	70 39 58	2173	68 50 49	2165	67 1 28	2157
	a Arietis	E.	86 35 21	2294	84 49 12	2287	83 2 53	2279	81 16 23	2273
2	Antares	W.	76 27 40	2144	78 17 32	2140	80 7 31	2136	81 57 35	2133
	Mars	E.	38 40 10	2202	36 51 45	2198	35 3 14	2194	33 14 37	2191
	Saturn	E.	57 52 12	2129	56 1 57	2125	54 11 35	2121	52 21 8	2118
	a Arietis	E.	72 21 54	2254	70 34 46	2253	68 47 37	2253	67 0 28	2254
	Aldebaran	E.	102 40 57	2141	100 51 1	2138	99 1 0	2134	97 10 53	2131
3	Antares	W.	91 8 47	2127	92 59 5	2128	94 49 22	2129	96 39 37	2131
	a Aquilæ	W.	51 12 27	3513	52 32 37	3445	53 54 3	3383	55 16 39	3329
	Mars	E.	24 10 35	2182	22 21 41	2183	20 32 48	2184	18 43 56	2186
	Saturn	E.	43 8 7	2114	41 17 28	2115	39 26 51	2116	37 36 15	2117
	a Arietis	E.	58 5 31	2274	56 18 53	2282	54 32 26	2291	52 46 14	2302
	Aldebaran	E.	87 59 28	2126	86 9 8	2127	84 18 49	2128	82 28 32	2130
4	Antares	W.	105 49 53	2148	107 39 39	2153	109 29 18	2159	111 18 48	2165
	a Aquilæ	W.	62 23 21	3134	63 50 49	3107	65 18 50	3083	66 47 20	3063
	Saturn	E.	28 24 17	2136	26 34 12	2141	24 44 15	2147	22 54 28	2153
	a Arietis	E.	43 59 53	2382	42 15 53	2405	40 32 26	2431	38 49 36	2461
	Aldebaran	E.	73 18 4	2147	71 28 16	2152	69 38 35	2157	67 49 3	2163
5	*a* Aquilæ	W.	74 14 55	3002	75 45 5	2997	77 15 22	2993	78 45 44	2992
	Aldebaran	E.	58 43 52	2200	56 55 24	2209	55 7 10	2218	53 19 9	2227
	Sun	E.	123 12 15	2491	121 30 49	2499	119 49 34	2507	118 8 30	2516
6	*a* Aquilæ	W.	86 17 20	3008	87 47 23	3017	89 17 15	3026	90 46 56	3036
	Fomalhaut	W.	52 45 34	2524	54 26 14	2522	56 6 58	2520	57 47 43	2520
	Mars	W.	18 57 19	2313	20 43 0	2322	22 28 28	2331	24 13 42	2341
	Aldebaran	E.	44 22 46	2281	42 36 18	2294	40 50 9	2306	39 4 18	2319
	Sun	E.	109 46 18	2563	108 6 32	2573	106 27 0	2583	104 47 42	2594
7	*a* Aquilæ	W.	98 11 31	3110	99 39 28	3129	101 7 2	3149	102 34 12	3171
	Fomalhaut	W.	66 10 54	2537	67 51 16	2543	69 31 30	2549	71 11 36	2556
	a Pegasi	W.	50 25 41	3050	51 54 52	3026	53 24 32	3006	54 54 37	2990
	Mars	W.	32 56 17	2391	34 40 4	2402	36 23 36	2412	38 6 53	2422
	Aldebaran	E.	30 20 8	2396	28 36 27	2415	26 53 13	2435	25 10 28	2456
	Sun	E.	96 34 57	2650	94 57 10	2661	93 19 38	2673	91 42 22	2684
8	Fomalhaut	W.	79 29 32	2596	81 8 33	2605	82 47 21	2614	84 25 57	2624
	a Pegasi	W.	62 29 11	2941	64 0 37	2937	65 32 9	2934	67 3 45	2933
	Mars	W.	46 39 37	2475	48 21 25	2486	50 2 58	2497	51 44 16	2507
	Saturn	W.	28 50 58	2419	30 34 5	2429	32 16 58	2439	33 59 37	2450
	Sun	E.	83 39 56	2744	82 4 14	2756	80 28 48	2767	78 53 37	2779
9	Fomalhaut	W.	92 35 27	2677	94 12 38	2689	95 49 33	2700	97 26 13	2712
	α Pegasi	W.	74 41 47	2941	76 13 15	2945	77 44 37	2950	79 15 53	2955
	Mars	W.	60 7 10	2559	61 47 2	2569	63 26 40	2579	65 6 4	2589
	Saturn	W.	42 29 10	2502	44 10 21	2512	45 51 17	2522	47 32 0	2533

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	$\mathrm{III}^{\mathrm{h}}$	P. L. of Diff.	VI^{h}	P. L. of Diff.	IX^{h}	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
9	SUN	E.	77 18 42	2791	75 44 3	2803	74 9 39	2815	72 35 30	2826
10	Fomalhaut	W.	99 2 37	2724	100 38 45	27.6	102 14 37	2748	103 50 13	2761
	α Pegasi	W.	80 47 3	2962	82 18 4	2969	83 48 56	2976	85 19 39	2984
	MARS	W.	66 45 15	2599	68 24 12	2609	70 2 55	2618	71 41 25	2628
	SATURN	W.	49 12 28	2543	50 52 42	2553	52 32 42	2563	54 12 28	2573
	α Arietis	W.	37 12 50	2859	38 46 1	2848	40 19 27	2839	41 53 5	2831
	SUN	E.	64 48 33	2885	63 15 55	2897	61 43 32	2909	60 11 24	2920
11	α Pegasi	W.	92 50 29	3033	94 20 1	3044	95 49 19	3056	97 18 22	3069
	MARS	W.	79 50 40	2675	81 27 53	2684	83 4 53	2693	84 41 42	2703
	SATURN	W.	62 27 57	2621	64 6 23	2631	65 44 36	2640	67 22 36	2649
	α Arietis	W.	49 42 50	2819	51 16 53	2820	52 50 55	2821	54 24 55	2823
	Aldebaran	W.	18 12 25	2777	19 47 23	2766	21 22 36	2758	22 58 0	2753
	SUN	E.	52 34 20	2977	51 3 39	2989	49 33 12	3000	48 2 59	3012
12	α Pegasi	W.	104 39 35	3140	106 6 56	3156	107 33 58	3173	109 0 40	3191
	MARS	W.	92 42 44	2747	94 18 21	2756	95 53 47	2764	97 29 2	2772
	SATURN	W.	75 29 29	2695	77 6 15	2704	78 42 49	2713	80 19 11	2722
	α Arietis	W.	62 13 56	2843	63 47 28	2848	65 20 53	2853	66 54 12	2859
	Aldebaran	W.	30 55 39	2756	32 31 4	2761	34 6 23	2765	35 41 36	2770
	SUN	E.	40 35 32	3070	39 6 46	3083	37 38 16	3096	36 10 1	3108
13	MARS	W.	105 22 32	2814	106 56 41	2822	108 30 40	2830	110 4 29	2838
	SATURN	W.	88 18 8	2766	89 53 21	2774	91 28 23	2782	93 3 14	2790
	α Arietis	W.	74 38 48	2891	76 11 18	2898	77 43 40	2905	79 15 53	2912
	Aldebaran	W.	43 35 48	2802	45 10 13	2809	46 44 29	2815	48 18 37	2823
	SUN	E.	28 52 43	3178	27 26 7	3194	25 59 50	3212	24 33 54	3231
18	SUN	W.	28 16 51	3480	29 37 38	3480	30 58 25	3479	32 19 13	3480
	Antares	E.	76 15 13	3066	74 46 22	3071	73 17 37	3075	71 48 57	3079
19	SUN	W.	39 3 5	3481	40 23 50	3481	41 44 35	3481	43 5 20	3481
	Antares	E.	64 26 43	3095	62 58 27	3098	61 30 15	3100	60 2 5	3102
	α Aquilæ	E.	109 48 48	3947	108 36 16	3935	107 23 32	3923	106 10 36	3912
20	SUN	W.	49 49 13	3477	51 10 3	3475	52 30 55	3473	53 51 49	3471
	Antares	E.	52 41 43	3107	51 13 42	3108	49 45 42	3108	48 17 42	3107
	α Aquilæ	E.	100 3 18	3867	98 49 25	3860	97 35 24	3854	96 21 17	3848
21	SUN	W.	60 37 7	3454	61 58 23	3448	63 19 45	3443	64 41 13	3437
	Antares	E.	40 57 30	3103	39 29 24	3102	38 1 16	3101	36 33 7	3099
	α Aquilæ	E.	90 9 21	3825	88 54 45	3822	87 40 6	3820	86 25 24	3817
22	SUN	W.	71 30 16	3403	72 52 29	3395	74 14 51	3386	75 37 23	3377
	Spica	W.	18 16 19	3251	19 41 28	3214	21 7 20	3181	22 33 52	3151
	Antares	E.	29 11 53	3093	27 43 35	3093	26 15 17	3093	24 46 59	3094
	α Aquilæ	E.	80 11 27	3813	78 56 38	3814	77 41 50	3815	76 27 3	3817
23	SUN	W.	82 32 53	3324	83 56 37	3313	85 20 34	3300	86 44 46	3288
	Spica	W.	29 54 20	3040	31 23 43	3021	32 53 29	3003	34 23 38	2985
	α Aquilæ	E.	70 14 0	3840	68 59 39	3848	67 45 26	3857	66 31 22	3867

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh	P. L. of Diff.	XVIIIh	P. L. of Diff.	XXIh	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
9	Sun	E.	71 1 36	2838	69 27 58	2850	67 54 35	2862	66 21 27	2873
10	Fomalhaut	W.	105 25 32	2775	107 0 33	2788	108 35 17	2801	110 9 43	2815
	α Pegasi	W.	86 50 12	2993	88 20 34	3002	89 50 45	3012	91 20 43	3022
	Mars	W.	73 19 42	2638	74 57 46	2648	76 35 36	2657	78 13 14	2666
	Saturn	W.	55 52 1	2583	57 31 20	2592	59 10 25	2602	60 49 18	2612
	α Arietis	W.	43 26 52	2826	45 0 46	2822	46 34 45	2820	48 8 47	2819
	Sun	E.	58 39 30	2931	57 7 50	2943	55 36 26	2954	54 5 16	2965
11	α Pegasi	W.	98 47 10	3082	100 15 42	3096	101 43 57	3110	103 11 55	3124
	Mars	W.	86 18 18	2712	87 54 42	2721	89 30 54	2729	91 6 55	2738
	Saturn	W.	69 0 24	2659	70 37 59	2669	72 15 21	2678	73 52 31	2687
	α Arietis	W.	55 58 53	2827	57 32 46	2831	59 6 34	2834	60 40 18	2838
	Aldebaran	W.	24 33 30	2750	26 9 4	2750	27 44 38	2751	29 20 10	2753
	Sun	E.	46 33 1	3023	45 3 17	3035	43 33 48	3047	42 4 33	3058
12	α Pegasi	W.	110 27 0	3210	111 52 58	3230	113 18 32	3250	114 43 42	3270
	Mars	W.	99 4 6	2781	100 38 59	2790	102 13 40	2798	103 48 11	2806
	Saturn	W.	81 55 22	2731	83 31 21	2740	85 7 8	2748	86 42 44	2757
	α Arietis	W.	68 27 23	2866	70 0 26	2872	71 33 21	2878	73 6 9	2884
	Aldebaran	W.	37 16 43	2776	38 51 42	2783	40 26 32	2789	42 1 14	2795
	Sun	E.	34 42 1	3121	33 14 17	3134	31 46 49	3148	30 19 37	3163
13	Mars	W.	111 38 7	2847	113 11 34	2855	114 44 51	2863	116 17 57	2870
	Saturn	W.	94 37 55	2799	96 12 24	2808	97 46 42	2816	99 20 49	2823
	α Arietis	W.	80 47 56	2920	82 19 50	2927	83 51 35	2935	85 23 10	2942
	Aldebaran	W.	49 52 35	2830	51 26 24	2838	53 0 3	2845	54 33 33	2852
	Sun	E.	23 8 21	3252	21 43 13	3275	20 18 31	3299	18 54 18	3326
18	Sun	W.	33 40 0	3480	35 0 47	3480	36 21 33	3480	37 42 19	3480
	Antares	E.	70 20 22	3083	68 51 51	3086	67 23 25	3089	65 55 2	3092
19	Sun	W.	44 26 6	3481	45 46 51	3480	47 7 37	3479	48 28 24	3478
	Antares	E.	58 33 57	3104	57 5 52	3105	55 37 48	3105	54 9 45	3106
	α Aquilæ	E.	104 57 28	3902	103 44 9	3892	102 30 41	3883	101 17 4	3875
20	Sun	W.	55 12 45	3468	56 33 45	3465	57 54 48	3462	59 15 55	3458
	Antares	E.	46 49 41	3107	45 21 40	3106	43 53 38	3105	42 25 35	3104
	α Aquilæ	E.	95 7 4	3842	93 52 45	3838	92 38 22	3833	91 23 54	3829
21	Sun	W.	66 2 47	3431	67 24 28	3425	68 46 16	3418	70 8 12	3411
	Antares	E.	35 4 56	3097	33 36 43	3096	32 8 28	3094	30 40 11	3093
	α Aquilæ	E.	85 10 39	3815	83 55 52	3814	82 41 5	3813	81 26 16	3813
22	Sun	W.	77 0 6	3367	78 23 0	3357	79 46 5	3346	81 9 23	3335
	Spica	W.	24 0 59	3125	25 28 38	3101	26 56 46	3079	28 25 21	3059
	Antares	E.	23 18 45	3101	21 50 37	3109	20 22 38	3119	18 54 50	3130
	α Aquilæ	E.	75 12 19	3820	73 57 38	3823	72 43 0	3828	71 28 27	3833
23	Sun	W.	88 9 12	3274	89 33 54	3260	90 58 52	3246	92 24 7	3232
	Spica	W.	35 54 9	2968	37 25 1	2951	38 56 15	2934	40 27 50	2917
	α Aquilæ	E.	65 17 29	3879	64 3 48	3893	62 50 20	3908	61 37 8	3924

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh	P. L. of Diff.	VIh	P. L. of Diff.	IXh	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
23	*a* Pegasi	E.	117 26 10	3471	116 5 13	3447	114 43 50	3423	113 22 0	3400
24	Sun	W.	93 49 38	3217	95 15 27	3202	96 41 34	3186	98 8 0	3169
	Spica	W.	41 59 47	2900	43 32 5	2883	45 4 46	2866	46 37 48	2848
	a Aquilæ	E.	60 24 13	3944	59 11 38	3967	57 59 26	3992	56 47 39	4021
	a Pegasi	E.	106 26 22	3291	105 2 0	3270	103 37 14	3250	102 12 4	3230
	Mars	E.	122 13 3	2842	120 39 30	2827	119 5 38	2812	117 31 26	2797
25	Sun	W.	105 25 9	3085	106 53 37	3067	108 22 27	3049	109 51 39	3030
	Spica	W.	54 28 38	2761	56 3 58	2743	57 39 41	2724	59 15 49	2705
	a Aquilæ	E.	50 56 56	4226	49 48 54	4283	48 41 46	4347	47 35 37	4419
	a Pegasi	E.	95 0 24	3134	93 32 56	3116	92 5 6	3098	90 36 54	3081
	Mars	E.	109 35 14	2714	107 58 53	2697	106 22 10	2680	104 45 3	2661
	Saturn	E.	125 46 42	2716	124 10 24	2698	122 33 42	2681	120 56 37	2664
26	Sun	W.	117 23 28	2936	118 55 0	2917	120 26 57	2898	121 59 19	2879
	Spica	W.	67 22 42	2612	69 1 21	2593	70 40 26	2574	72 19 57	2555
	Antares	W.	21 40 39	2697	23 17 23	2666	24 54 49	2636	26 32 55	2608
	a Pegàsi	E.	83 10 39	2999	81 40 24	2984	80 9 51	2969	78 39 0	2955
	Mars	E.	96 33 17	2569	94 53 40	2550	93 13 37	2531	91 33 7	2512
	Saturn	E.	112 45 15	2574	111 5 44	2556	109 25 48	2537	107 45 26	2519
27	Spica	W.	80 44 9	2460	82 26 19	2441	84 8 56	2422	85 52 0	2403
	Antares	W.	34 52 34	2483	36 34 11	2461	38 16 19	2440	39 58 57	2418
	Mars	E.	83 3 58	2417	81 20 46	2398	79 37 8	2379	77 53 2	2360
	Saturn	E.	99 17 8	2424	97 34 8	2404	95 50 42	2387	94 6 49	2368
	a Arietis	E.	113 5 54	2567	111 26 14	2545	109 46 4	2524	108 5 24	2503
28	Spica	W.	94 33 50	2314	96 19 29	2297	98 5 33	2280	99 52 2	2264
	Antares	W.	48 39 33	2318	50 25 5	2300	52 11 4	2282	53 57 30	2264
	Mars	E.	69 5 50	2268	67 19 4	2251	65 31 52	2233	63 44 14	2216
	Saturn	E.	85 20 51	2280	83 34 22	2262	81 47 27	2245	80 0 7	2229
	a Arietis	E.	99 34 55	2405	97 51 27	2387	96 7 34	2369	94 23 15	2352
29	Spica	W.	108 50 10	2190	110 38 53	2177	112 27 56	2164	114 17 18	2152
	Antares	W.	62 55 57	2184	64 44 49	2169	66 34 3	2155	68 23 38	2142
	Mars	E.	54 39 58	2138	52 49 57	2124	50 59 34	2110	49 8 50	2097
	Saturn	E.	70 57 32	2153	69 7 53	2139	67 17 53	2126	65 27 33	2113
	a Arietis	E.	85 35 46	2276	83 49 11	2263	82 2 17	2251	80 15 5	2239
	Aldebaran	E.	116 12 51	2185	114 24 1	2170	112 34 48	2156	110 45 14	2143
30	Antares	W.	77 36 20	2085	79 27 43	2075	81 19 20	2066	83 11 11	2059
	Mars	E.	39 50 25	2040	37 57 53	2030	36 5 5	2021	34 12 4	2014
	Saturn	E.	56 11 13	2057	54 19 8	2048	52 26 48	2040	50 34 15	2032
	a Arietis	E.	71 15 8	2194	69 26 31	2188	67 37 45	2182	65 48 51	2178
	Aldebaran	E.	101 32 40	2086	99 41 19	2076	97 49 43	2068	95 57 54	2060
31	Antares	W.	92 33 8	2030	94 25 56	2026	96 18 50	2023	98 11 48	2021
	Mars	E.	24 44 15	1984	22 50 16	1981	20 56 11	1979	19 2 3	1978
	Saturn	E.	41 8 51	2003	39 15 22	2000	37 21 47	1997	35 28 8	1995
	a Arietis	E.	56 43 28	2178	54 54 27	2182	53 5 33	2188	51 16 47	2195
	Aldebaran	E.	86 36 7	2031	84 43 21	2028	82 50 30	2025	80 57 34	2023

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XV^h	P. L. of Diff.	XVIII^h	P. L. of Diff.	XXI^h	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
23	α Pegasi	E.	111 59 43	3378	110 37 1	3355	109 13 53	3333	107 50 20	3312
24	Sun	W.	99 34 46	3153	101 1 51	3136	102 29 16	3119	103 57 2	3102
	Spica	W.	48 11 13	2831	49 45 0	2814	51 19 9	2796	52 53 42	2779
	α Aquilæ	E.	55 36 20	4053	54 25 33	4089	53 15 20	4129	52 5 46	4174
	α Pegasi	E.	100 46 30	3210	99 20 33	3191	97 54 13	3172	96 27 30	3153
	Mars	E.	115 56 54	2781	114 22 2	2765	112 46 48	2748	111 11 12	2731
25	Sun	W.	111 21 14	3012	112 51 12	2993	114 21 34	2974	115 52 19	2955
	Spica	W.	60 52 22	2687	62 29 19	2668	64 6 41	2649	65 44 29	2631
	α Aquilæ	E.	46 30 33	4501	45 26 42	4594	44 24 12	4697	43 23 11	4812
	α Pegasi	E.	89 8 21	3064	87 39 26	3047	86 10 11	3030	84 40 35	3014
	Mars	E.	103 7 31	2643	101 29 35	2625	99 51 14	2607	98 12 28	2588
	Saturn	E.	119 19 9	2646	117 41 17	2629	116 3 1	2610	114 24 20	2592
26	Sun	W.	123 32 5	2859	125 5 16	2840	126 38 52	2820	128 12 53	2800
	Spica	W.	73 59 54	2536	75 40 18	2517	77 21 8	2497	79 2 25	2478
	Antares	W.	28 11 39	2581	29 51 0	2555	31 30 58	2530	33 11 30	2506
	α Pegasi	E.	77 7 51	2942	75 36 26	2931	74 4 47	2919	72 32 53	2907
	Mars	E.	89 52 11	2493	88 10 48	2474	86 28 59	2455	84 46 42	2436
	Saturn	E.	106 4 39	2500	104 23 26	2481	102 41 46	2462	100 59 40	2443
27	Spica	W.	87 35 30	2385	89 19 26	2367	91 3 48	2349	92 48 36	2331
	Antares	W.	41 42 6	2397	43 25 45	2377	45 9 52	2357	46 54 28	2337
	Mars	E.	76 8 30	2341	74 23 30	2323	72 38 4	2304	70 52 10	2286
	Saturn	E.	92 22 29	2351	90 37 44	2333	88 52 32	2315	87 6 54	2298
	α Arietis	E.	106 24 14	2482	104 42 36	2462	103 0 30	2443	101 17 56	2424
28	Spica	W.	101 38 54	2248	103 26 10	2233	105 13 48	2218	107 1 48	2204
	Antares	W.	55 44 22	2247	57 31 39	2231	59 19 21	2215	61 7 27	2199
	Mars	E.	61 56 11	2200	60 7 44	2184	58 18 52	2169	56 29 37	2153
	Saturn	E.	78 12 23	2213	76 24 15	2197	74 35 43	2182	72 46 49	2167
	α Arietis	E.	92 38 31	2336	90 53 23	2320	89 7 53	2304	87 22 0	2290
29	Spica	W.	116 6 59	2140	117 56 57	2130	119 47 11	2120	121 37 40	2111
	Antares	W.	70 13 34	2129	72 3 49	2117	73 54 22	2106	75 45 13	2095
	Mars	E.	47 17 46	2085	45 26 23	2073	43 34 41	2061	41 42 41	2050
	Saturn	E.	63 36 53	2100	61 45 54	2088	59 54 37	2077	58 3 3	2067
	α Arietis	E.	78 27 35	2228	76 39 49	2218	74 51 48	2209	73 3 34	2201
	Aldebaran	E.	108 55 20	2130	107 5 7	2118	105 14 35	2107	103 23 46	2096
30	Antares	W.	85 3 14	2052	86 55 28	2045	88 47 53	2039	90 40 27	2034
	Mars	E.	32 18 51	2007	30 25 26	2000	28 31 51	1994	26 38 7	1989
	Saturn	E.	48 41 30	2025	46 48 34	2018	44 55 28	2013	43 2 13	2008
	α Arietis	E.	63 59 50	2175	62 10 45	2174	60 21 39	2174	58 32 33	2175
	Aldebaran	E.	94 5 53	2053	92 13 41	2046	90 21 18	2040	88 28 46	2035
31	Antares	W.	100 4 49	2021	101 57 51	2020	103 50 54	2021	105 43 56	2022
	Mars	E.	17 7 53	1978	15 13 44	1979	13 19 37	1981	11 25 33	1984
	Saturn	E.	33 34 26	1994	31 40 43	1994	29 46 59	1994	27 53 16	1995
	α Arietis	E.	49 28 11	2204	47 39 50	2216	45 51 48	2231	44 4 7	2247
	Aldebaran	E.	79 4 36	2022	77 11 36	2022	75 18 36	2023	73 25 37	2023

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S					Sidereal Time of Semi-diameter Passing Meridian.	Equation of Time, to be Added to / Subtracted from Apparent Time.	Diff. for 1 Hour.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Semi-diameter.			
		h m s	s	° ′ ″	″	′ ″	s	m s	s
Wed.	1	10 40 5.24	9.072	N. 8 25 50.8	−54.29	15 53.04	64.39	0 3.37	0.782
Thur.	2	10 43 42.81	9.060	8 4 4.0	54.62	15 53.27	64.35	0 15.57	0.794
Frid.	3	10 47 20.11	9.049	7 42 9.3	54.95	15 53.50	64.30	0 34.77	0.805
Sat.	4	10 50 57.16	9.039	7 20 7.0	−55.25	15 53.73	64.26	0 54.22	0.816
SUN.	5	10 54 33.98	9.030	6 57 57.5	55.54	15 53.96	64.22	1 13.90	0.825
Mon.	6	10 58 10.58	9.021	6 35 41.1	55.82	15 54.19	64.19	1 33.80	0.834
Tues.	7	11 1 46.98	9.013	6 13 18.0	−56.09	15 54.43	64.16	1 53.90	0.841
Wed.	8	11 5 23.19	9.006	5 50 48.7	56.34	15 54.67	64.13	2 14.18	0.848
Thur.	9	11 8 59.25	9.000	5 28 13.4	56.58	15 54.91	64.11	2 34.62	0.855
Frid.	10	11 12 35.16	8.995	5 5 32.5	−56.81	15 55.15	64.09	2 55.20	0.861
Sat.	11	11 16 10.94	8.990	4 42 46.2	57.02	15 55.40	64.07	3 15.92	0.866
SUN.	12	11 19 46.61	8.985	4 19 54.9	57.22	15 55.65	64.05	3 36.75	0.870
Mon.	13	11 23 22.18	8.981	3 56 59.1	−57.41	15 55.90	64.04	3 57.68	0.874
Tues.	14	11 26 57.67	8.977	3 33 59.0	57.58	15 56.16	64.03	4 18.68	0.877
Wed.	15	11 30 33.09	8.974	3 10 55.0	57.74	15 56.42	64.02	4 39.75	0.879
Thur.	16	11 34 8.46	8.973	2 47 47.4	−57.88	15 56.68	64.02	5 0.87	0.881
Frid.	17	11 37 43.80	8.972	2 24 36.6	58.01	15 56.94	64.02	5 22.03	0.882
Sat.	18	11 41 19.13	8.972	2 1 23.0	58.12	15 57.20	64.02	5 43.20	0.882
SUN.	19	11 44 54.47	8.972	1 38 6.9	−58.22	15 57.47	64.02	6 4.35	0.881
Mon.	20	11 48 29.84	8.974	1 14 48.6	58.30	15 57.74	64.03	6 25.48	0.880
Tues.	21	11 52 5.25	8.976	0 51 28.6	58.37	15 58.01	64.04	6 46.57	0.878
Wed.	22	11 55 40.72	8.979	0 28 7.2	−58.42	15 58.28	64.05	7 7.61	0.875
Thur.	23	11 59 16.26	8.983	N. 0 4 44.6	58.46	15 58.56	64.06	7 28.57	0.871
Frid.	24	12 2 51.89	8.987	S. 0 18 38.7	58.48	15 58.84	64.08	7 49.43	0.867
Sat.	25	12 6 27.64	8.993	0 42 2.4	−58.49	15 59.12	64.10	8 10.17	0.862
SUN.	26	12 10 3.53	9.000	1 5 26.1	58.48	15 59.40	64.13	8 30.77	0.855
Mon.	27	12 13 39.60	9.008	1 28 49.6	58.46	15 59.67	64.16	8 51.21	0.847
Tues.	28	12 17 15.87	9.016	1 52 12.4	−58.43	15 59.94	64.19	9 11.45	0.838
Wed.	29	12 20 52.35	9.025	2 15 34.3	58.39	16 0.22	64.22	9 31.47	0.829
Thur.	30	12 24 29.06	9.035	2 38 55.0	58.33	16 0.50	64.26	9 51.26	0.819
Frid.	31	12 28 6.04	9.047	S. 3 2 14.2	−58.26	16 0.78	64.31	10 10.78	0.807

Note.—The mean time of semidiameter passing the meridian may be found by subtracting 0^{s}.18 from the sidereal time. The sign − prefixed to the hourly change of declination indicates that north declinations are decreasing; south declinations increasing.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S Apparent Right Ascension.	THE SUN'S Diff. for 1 Hour.	THE SUN'S Apparent Declination.	THE SUN'S Diff. for 1 Hour.	Equation of Time, to be Subtracted from / Added to Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		h m s	s	° ′ ″	″	m s	s	h m s
Wed.	1	10 40 5.23	9.074	N. 8 25 51.0	−54.30	0 3.37	0.782	10 40 1.86
Thur.	2	10 43 42.85	9.062	8 4 3.8	54.63	0 15.57	0.794	10 43 58.42
Frid.	3	10 47 20.20	9.051	7 42 8.8	54.96	0 34.77	0.805	10 47 54.97
Sat.	4	10 50 57.30	9.040	7 20 6.2	−55.26	0 54.22	0.816	10 51 51.52
SUN.	5	10 54 34.16	9.031	6 57 56.4	55.56	1 13.92	0.825	10 55 48.08
Mon.	6	10 58 10.81	9.023	6 35 39.6	55.84	1 33.82	0.834	10 59 44.63
Tues.	7	11 1 47.26	9.015	6 13 16.2	−56.11	1 53.93	0.841	11 3 41.19
Wed.	8	11 5 23.53	9.008	5 50 46.6	56.36	2 14.21	0.848	11 7 37.74
Thur.	9	11 8 59.64	9.001	5 28 11.0	56.61	2 34.65	0.855	11 11 34.29
Frid.	10	11 12 35.60	8.995	5 5 29.7	−56.83	2 55.24	0.861	11 15 30.84
Sat.	11	11 16 11.43	8.990	4 42 43.1	57.05	3 15.97	0.866	11 19 27.40
SUN.	12	11 19 47.15	8.986	4 19 51.5	57.25	3 36.81	0.870	11 23 23.95
Mon.	13	11 23 22.77	8.982	3 56 55.3	−57.43	3 57.74	0.874	11 27 20.51
Tues.	14	11 26 58.31	8.979	3 33 54.9	57.60	4 18.75	0.877	11 31 17.06
Wed.	15	11 30 33.78	8.977	3 10 50.5	57.77	4 39.83	0.879	11 35 13.61
Thur.	16	11 34 9.21	8.976	2 47 42.6	−57.91	5 0.95	0.881	11 39 10.16
Frid.	17	11 37 44.61	8.975	2 24 31.5	58.04	5 22.10	0.882	11 43 6.72
Sat.	18	11 41 19.99	8.975	2 1 17.5	58.14	5 43.28	0.882	11 47 3.27
SUN.	19	11 44 55.38	8.975	1 38 1.0	−58.24	6 4.44	0.881	11 50 59.82
Mon.	20	11 48 30.80	8.976	1 14 42.4	58.32	6 25.57	0.880	11 54 56.38
Tues.	21	11 52 6.26	8.978	0 51 22.0	58.38	6 46.67	0.878	11 58 52.93
Wed.	22	11 55 41.77	8.981	0 28 0.2	−58.43	7 7.71	0.875	12 2 49.48
Thur.	23	11 59 17.36	8.985	N. 0 4 37.3	58.48	7 28.68	0.871	12 6 46.04
Frid.	24	12 2 53.05	8.990	S. 0 18 46.4	58.50	7 49.55	0.867	12 10 42.59
Sat.	25	12 6 28.86	8.996	0 42 10.4	−58.51	8 10.29	0.862	12 14 39.15
SUN.	26	12 10 4.81	9.002	1 5 34.4	58.50	8 30.89	0.855	12 18 35.70
Mon.	27	12 13 40.93	9.009	1 28 58.2	58.48	8 51.32	0.847	12 22 32.25
Tues.	28	12 17 17.25	9.018	1 52 21.4	−58.44	9 11.55	0.838	12 26 28.80
Wed.	29	12 20 53.78	9.027	2 15 43.6	58.40	9 31.58	0.829	12 30 25.35
Thur.	30	12 24 30.54	9.037	2 39 4.6	58.34	9 51.37	0.819	12 34 21.91
Frid.	31	12 28 7.57	9.049	S. 3 2 24.1	−58.27	10 10.89	0.807	12 38 18.46

Note.—The semidiameter for mean noon may be assumed the same as that for apparent noon.
The sign − prefixed to the hourly change of declination indicates that north declinations are decreasing; south declinations increasing.

Diff. for 1 Hour,
$+ 9^{s}.8565$.
(Table III.)

AT GREENWICH MEAN NOON.

Day of the Month.	Day of the Year.	THE SUN'S TRUE LONGITUDE. λ	THE SUN'S TRUE LONGITUDE. λ′	THE SUN'S Diff. for 1 Hour.	THE SUN'S LATITUDE.	Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.
		° ′ ″	′ ″	″	″			h m s
1	244	158 23 18.6	23 0.7	145.17	— 0.36	0.003 8349	− 43.0	13 17 47.08
2	245	159 21 23.7	21 5.6	145.25	0.32	0.003 7314	43.2	13 13 51.18
3	246	160 19 30.6	19 12.4	145.33	0.24	0.003 6274	43.5	13 9 55.27
4	247	161 17 39.4	17 21.2	145.41	— 0.16	0.003 5227	− 43.8	13 5 59.36
5	248	162 15 50.3	15 31.9	145.50	— 0.03	0.003 4173	44.1	13 2 3.45
6	249	163 14 3.2	13 44.7	145.59	+ 0.09	0.003 3111	44.5	12 58 7.54
7	250	164 12 18.2	11 59.6	145.67	+ 0.22	0.003 2039	− 44.9	12 54 11.64
8	251	165 10 35.2	10 16.5	145.75	0.34	0.003 0956	45.3	12 50 15.73
9	252	166 8 54.3	8 35.5	145.83	0.45	0.002 9861	45.8	12 46 19.82
10	253	167 7 15.5	6 56.6	145.92	+ 0.54	0.002 8754	− 46.4	12 42 23.92
11	254	168 5 38.7	5 19.7	146.01	0.61	0.002 7634	46.9	12 38 28.01
12	255	169 4 3.9	3 44.8	146.09	0.65	0.002 6501	47.5	12 34 32.10
13	256	170 2 31.0	2 11.8	146.17	+ 0.66	0.002 5354	− 48.1	12 30 36.19
14	257	171 1 0.1	0 40.8	146.25	0.67	0.002 4195	48.6	12 26 40.28
15	258	171 59 31.0	59 11.6	146.33	0.63	0.002 3022	49.1	12 22 44.38
16	259	172 58 3.9	57 44.4	146.41	+ 0.57	0.002 1837	− 49.6	12 18 48.47
17	260	173 56 38.5	56 18.9	146.48	0.48	0.002 0639	50.1	12 14 52.56
18	261	174 55 14.9	54 55.2	146.56	0.38	0.001 9431	50.6	12 10 56.65
19	262	175 53 53.1	53 33.3	146.63	+ 0.26	0.001 8213	− 51.0	12 7 0.75
20	263	176 52 33.1	52 13.2	146.70	+ 0.13	0.001 6985	51.3	12 3 4.84
21	264	177 51 14.7	50 54.7	146.77	0.00	0.001 5749	51.6	11 59 8.93
22	265	178 49 58.0	49 37.9	146.84	— 0.13	0.001 4506	− 51.9	11 55 13.03
23	266	179 48 43.1	48 22.9	146.91	0.25	0.001 3259	52.1	11 51 17.12
24	267	180 47 29.8	47 9.5	146.98	0.35	0.001 2007	52.2	11 47 21.21
25	268	181 46 18.3	45 57.8	147.05	— 0.42	0.001 0754	− 52.2	11 43 25.31
26	269	182 45 8.4	44 47.9	147.12	0.49	0.000 9500	52.2	11 39 29.40
27	270	183 44 0.4	43 39.8	147.20	0.53	0.000 8247	52.1	11 35 33.49
28	271	184 42 54.3	42 33.5	147.28	— 0.52	0.000 6997	− 52.0	11 31 37.58
29	272	185 41 50.0	41 29.2	147.37	0.49	0.000 5752	51.9	11 27 41.68
30	273	186 40 47.8	40 26.9	147.45	0.42	0.000 4511	51.7	11 23 45.77
31	274	187 39 47.7	39 26.7	147.54	— 0.33	0.000 3274	− 51.5	11 19 49.86

Note.—The numbers in column λ correspond to the true equinox of the date; in column λ′ to the mean equinox of January $0^d.0$.

Diff. for 1 Hour, — $9^s.8296$. (Table II.)

GREENWICH MEAN TIME.

THE MOON'S

Day of the Month.	SEMIDIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
	′ ″	′ ″	′ ″	″	′ ″	″	h m	m	d
1	16 40.4	16 39.3	61 5.7	− 0.15	61 1.6	− 0.52	13 44.5	2.19	16.5
2	16 37.0	16 33.6	60 53.2	0.86	60 40.8	1.17	14 36.6	2.16	17.5
3	16 29.3	16 24.2	60 25.0	1.43	60 6.4	1.65	15 28.7	2.18	18.5
4	16 18.5	16 12.4	59 45.4	− 1.81	59 22.8	− 1.93	16 21.5	2.22	19.5
5	16 5.9	15 59.3	58 59.1	2.00	58 34.8	2.03	17 15.5	2.28	20.5
6	15 52.7	15 46.2	58 10.5	2.01	57 46.4	1.98	18 10.7	2.32	21.5
7	15 39.8	15 33.7	57 23.0	− 1.91	57 0.6	− 1.83	19 6.4	2.31	22.5
8	15 27.8	15 22.3	56 39.2	1.73	56 19.0	1.62	20 1.3	2.26	23.5
9	15 17.2	15 12.5	56 0.2	1.51	55 42.8	1.39	20 54.3	2.15	24.5
10	15 8.1	15 4.1	55 26.8	− 1.28	55 12.1	− 1.16	21 44.6	2.03	25.5
11	15 0.5	14 57.2	54 58.8	1.05	54 46.8	0.94	22 31.8	1.90	26.5
12	14 54.3	14 51.8	54 36.1	0.84	54 26.7	0.73	23 16.1	1.80	27.5
13	14 49.6	14 47.7	54 18.5	− 0.63	54 11.6	− 0.53	23 58.2	1.72	28.5
14	14 46.1	14 44.9	54 5.8	0.42	54 1.4	0.32	6	. . .	29.5
15	14 44.0	14 43.5	53 58.2	− 0.20	53 56.4	− 0.09	0 38.7	1.67	0.9
16	14 43.4	14 43.7	53 56.0	+ 0.03	53 57.1	+ 0.15	1 18.6	1.66	1.9
17	14 44.4	14 45.6	53 59.7	0.29	54 4.1	0.44	1 58.6	1.69	2.9
18	14 47.3	14 49.5	54 10.3	0.59	54 18.3	0.75	2 39.8	1.75	3.9
19	14 52.2	14 55.5	54 28.4	+ 0.92	54 40.4	+ 1.10	3 22.9	1.85	4.9
20	14 59.4	15 3.8	54 54.7	1.28	55 11.1	1.45	4 8.7	1.98	5.9
21	15 8.9	15 14.5	55 29.6	1.63	55 50.3	1.80	4 57.9	2.12	6.9
22	15 20.7	15 27.4	56 13.0	+ 1.97	56 37.5	+ 2.11	5 50.6	2.26	7.9
23	15 34.5	15 42.0	57 3.7	2.24	57 31.2	2.33	6 46.3	2.37	8.9
24	15 49.8	15 57.7	57 59.7	2.40	58 28.8	2.42	7 43.8	2.42	9.9
25	16 5.5	16 13.2	58 57.7	+ 2.38	59 26.0	+ 2.30	8 41.8	2.40	10.9
26	16 20.6	16 27.4	59 52.9	2.15	60 17.8	1.95	9 38.8	2.35	11.9
27	16 33.4	16 38.4	60 39.8	1.68	60 58.3	1.37	10 34.4	2.28	12.9
28	16 42.3	16 44.9	61 12.6	+ 1.00	61 22.3	+ 0.60	11 28.5	2.23	13.9
29	16 46.2	16 46.1	61 27.0	+ 0.18	61 26.5	− 0.25	12 21.7	2.21	14.9
30	16 44.6	16 41.7	61 21.0	− 0.67	61 10.5	1.06	13 15.1	2.24	15.9
31	16 37.6	16 32.4	60 55.5	1.41	60 36.5	1.72	14 9.3	2.29	16.9
32	16 26.4	16 19.7	60 14.3	− 1.96	59 49.4	− 2.15	15 4.9	2.35	17.9

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
WEDNESDAY 1.					FRIDAY 3.				
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	23 55 25.67	2.3008	S. 5 47 12.4	15.840	0	1 44 9.25	2.2532	N. 6 56 41.1	15.298
1	23 57 43.65	2.2984	5 31 21.0	15.872	1	1 46 24.46	2.2538	7 11 57.4	15.244
2	0 0 1.48	2.2960	5 15 27.7	15.902	2	1 48 39.71	2.2544	7 27 10.4	15.188
3	0 2 19.17	2.2937	4 59 32.7	15.930	3	1 50 54.99	2.2550	7 42 20.0	15.132
4	0 4 36.72	2.2914	4 43 36.1	15.957	4	1 53 10.31	2.2557	7 57 26.2	15.074
5	0 6 54.14	2.2892	4 27 37.9	15.982	5	1 55 25.67	2.2564	8 12 28.9	15.014
6	0 9 11.43	2.2872	4 11 38.3	16.004	6	1 57 41.08	2.2572	8 27 27.9	14.952
7	0 11 28.60	2.2851	3 55 37.4	16.025	7	1 59 56.54	2.2581	8 42 23.1	14.889
8	0 13 45.64	2.2830	3 39 35.3	16.043	8	2 2 12.05	2.2589	8 57 14.6	14.825
9	0 16 2.56	2.2811	3 23 32.2	16.060	9	2 4 27.61	2.2598	9 12 2.1	14.759
10	0 18 19.37	2.2792	3 7 28.1	16.075	10	2 6 43.23	2.2608	9 26 45.7	14.692
11	0 20 36.06	2.2773	2 51 23.2	16.088	11	2 8 58.91	2.2618	9 41 25.2	14.623
12	0 22 52.65	2.2756	2 35 17.5	16.100	12	2 11 14.65	2.2629	9 56 0.5	14.552
13	0 25 9.13	2.2738	2 19 11.2	16.109	13	2 13 30.46	2.2641	10 10 31.5	14.481
14	0 27 25.51	2.2722	2 3 4.4	16.116	14	2 15 46.34	2.2652	10 24 58.2	14.407
15	0 29 41.80	2.2707	1 46 57.3	16.121	15	2 18 2.29	2.2665	10 39 20.4	14.332
16	0 31 57.99	2.2691	1 30 49.9	16.125	16	2 20 18.32	2.2678	10 53 38.1	14.257
17	0 34 14.09	2.2676	1 14 42.3	16.127	17	2 22 34.43	2.2692	11 7 51.2	14.179
18	0 36 30.10	2.2662	0 58 34.7	16.126	18	2 24 50.62	2.2705	11 21 59.6	14.100
19	0 38 46.03	2.2648	0 42 27.2	16.124	19	2 27 6.89	2.2718	11 36 3.2	14.020
20	0 41 1.88	2.2636	0 26 19.8	16.121	20	2 29 23.25	2.2733	11 50 2.0	13.938
21	0 43 17.66	2.2624	S. 0 10 12.7	16.115	21	2 31 39.69	2.2748	12 3 55.8	13.855
22	0 45 33.37	2.2612	N. 0 5 54.0	16.107	22	2 33 56.22	2.2763	12 17 44.6	13.772
23	0 47 49.01	2.2601	N. 0 22 0.2	16.098	23	2 36 12.85	2.2779	N. 12 31 28.3	13.686
THURSDAY 2.					SATURDAY 4.				
0	0 50 4.58	2.2591	N. 0 38 5.8	16.087	0	2 38 29.57	2.2795	N. 12 45 6.9	13.598
1	0 52 20.10	2.2582	0 54 10.7	16.074	1	2 40 46.39	2.2811	12 58 40.2	13.510
2	0 54 35.56	2.2572	1 10 14.7	16.059	2	2 43 3.30	2.2827	13 12 8.1	13.421
3	0 56 50.97	2.2564	1 26 17.8	16.042	3	2 45 20.31	2.2844	13 25 30.6	13.330
4	0 59 6.33	2.2557	1 42 19.8	16.024	4	2 47 37.43	2.2862	13 38 47.7	13.237
5	1 1 21.65	2.2549	1 58 20.7	16.005	5	2 49 54.66	2.2880	13 51 59.2	13.144
6	1 3 36.92	2.2542	2 14 20.4	15.983	6	2 52 11.99	2.2897	14 5 5.0	13.049
7	1 5 52.16	2.2537	2 30 18.7	15.959	7	2 54 29.43	2.2916	14 18 5.1	12.953
8	1 8 7.37	2.2532	2 46 15.5	15.933	8	2 56 46.98	2.2934	14 30 59.4	12.856
9	1 10 22.55	2.2527	3 2 10.7	15.907	9	2 59 4.64	2.2952	14 43 47.8	12.757
10	1 12 37.70	2.2523	3 18 4.3	15.878	10	3 1 22.41	2.2972	14 56 30.2	12.657
11	1 14 52.83	2.2520	3 33 56.1	15.847	11	3 3 40.30	2.2991	15 9 6.7	12.557
12	1 17 7.94	2.2517	3 49 46.0	15.815	12	3 5 58.30	2.3010	15 21 37.1	12.455
13	1 19 23.04	2.2516	4 5 33.9	15.781	13	3 8 16.42	2.3030	15 34 1.3	12.352
14	1 21 38.13	2.2514	4 21 19.7	15.746	14	3 10 34.66	2.3049	15 46 19.3	12.247
15	1 23 53.21	2.2513	4 37 3.4	15.708	15	3 12 53.01	2.3069	15 58 31.0	12.142
16	1 26 8.29	2.2513	4 52 44.7	15.668	16	3 15 11.49	2.3090	16 10 36.4	12.036
17	1 28 23.37	2.2514	5 8 23.6	15.628	17	3 17 30.09	2.3110	16 22 35.3	11.927
18	1 30 38.46	2.2515	5 24 0.1	15.587	18	3 19 48.81	2.3130	16 34 27.7	11.818
19	1 32 53.55	2.2516	5 39 34.0	15.543	19	3 22 7.65	2.3151	16 46 13.5	11.708
20	1 35 8.65	2.2518	5 55 5.2	15.497	20	3 24 26.62	2.3172	16 57 52.7	11.598
21	1 37 23.77	2.2522	6 10 33.6	15.449	21	3 26 45.71	2.3192	17 9 25.3	11.487
22	1 39 38.91	2.2525	6 25 59.1	15.400	22	3 29 4.93	2.3213	17 20 51.1	11.373
23	1 41 54.07	2.2528	6 41 21.6	15.350	23	3 31 24.27	2.3234	17 32 10.1	11.259
24	1 44 9.25	2.2532	N. 6 56 41.1	15.298	24	3 33 43.74	2.3255	N. 17 43 22.2	11.144

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	SUNDAY 5.					TUESDAY 7.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	3 33 43.74	2.3255	N.17 43 22.2	11.144	0	5 27 25.58	2.3978	N.24 9 55.0	4.718
1	3 36 3.33	2.3276	17 54 27.4	11.028	1	5 29 49.46	2.3981	24 14 33.7	4.572
2	3 38 23.05	2.3297	18 5 25.6	10.911	2	5 32 13.35	2.3983	24 19 3.7	4.427
3	3 40 42.89	2.3317	18 16 16.7	10.792	3	5 34 37.26	2.3985	24 23 24.9	4.280
4	3 43 2.86	2.3338	18 27 0.7	10.673	4	5 37 1.17	2.3986	24 27 37.3	4.134
5	3 45 22.95	2.3359	18 37 37.5	10.553	5	5 39 25.09	2.3986	24 31 41.0	3.987
6	3 47 43.17	2.3380	18 48 7.1	10.433	6	5 41 49.00	2.3985	24 35 35.8	3.841
7	3 50 3.51	2.3400	18 58 29.5	10.312	7	5 44 12.91	2.3984	24 39 21.9	3.694
8	3 52 23.97	2.3421	19 8 44.5	10.188	8	5 46 36.81	2.3982	24 42 59.1	3.547
9	3 54 44.55	2.3441	19 18 52.1	10.065	9	5 49 0.70	2.3979	24 46 27.6	3.401
10	3 57 5.26	2.3461	19 28 52.3	9.941	10	5 51 24.56	2.3975	24 49 47.2	3.253
11	3 59 26.09	2.3482	19 38 45.0	9.815	11	5 53 48.40	2.3971	24 52 58.0	3.107
12	4 1 47.04	2.3502	19 48 30.1	9.688	12	5 56 12.21	2.3966	24 56 0.0	2.960
13	4 4 8.11	2.3521	19 58 7.6	9.562	13	5 58 35.99	2.3960	24 58 53.2	2.813
14	4 6 29.29	2.3541	20 7 37.5	9.434	14	6 0 59.73	2.3953	25 1 37.6	2.666
15	4 8 50.60	2.3561	20 16 59.7	9.305	15	6 3 23.43	2.3946	25 4 13.1	2.519
16	4 11 12.02	2.3579	20 26 14.1	9.176	16	6 5 47.08	2.3937	25 6 39.9	2.373
17	4 13 33.55	2.3597	20 35 20.8	9.046	17	6 8 10.68	2.3928	25 8 57.9	2.227
18	4 15 55.19	2.3617	20 44 19.6	8.915	18	6 10 34.22	2.3918	25 11 7.1	2.080
19	4 18 16.95	2.3635	20 53 10.6	8.783	19	6 12 57.70	2.3907	25 13 7.5	1.933
20	4 20 38.81	2.3652	21 1 53.6	8.651	20	6 15 21.11	2.3896	25 14 59.1	1.787
21	4 23 0.78	2.3671	21 10 28.7	8.518	21	6 17 44.45	2.3884	25 16 42.0	1.642
22	4 25 22.86	2.3688	21 18 55.8	8.384	22	6 20 7.72	2.3871	25 18 16.1	1.495
23	4 27 45.04	2.3706	N.21 27 14.8	8.249	23	6 22 30.90	2.3857	N.25 19 41.4	1.349
	MONDAY 6.					WEDNESDAY 8.			
0	4 30 7.33	2.3723	N.21 35 25.7	8.114	0	6 24 54.00	2.3842	N.25 20 58.0	1.204
1	4 32 29.72	2.3739	21 43 28.5	7.978	1	6 27 17.01	2.3827	25 22 5.9	1.059
2	4 34 52.20	2.3754	21 51 23.1	7.842	2	6 29 39.92	2.3810	25 23 5.1	0.914
3	4 37 14.77	2.3769	21 59 9.6	7.706	3	6 32 2.73	2.3793	25 23 55.6	0.769
4	4 39 37.43	2.3785	22 6 47.8	7.567	4	6 34 25.44	2.3775	25 24 37.4	0.625
5	4 42 0.19	2.3801	22 14 17.7	7.429	5	6 36 48.03	2.3756	25 25 10.6	0.482
6	4 44 23.04	2.3815	22 21 39.3	7.290	6	6 39 10.51	2.3737	25 25 35.2	0.338
7	4 46 45.97	2.3828	22 28 52.5	7.151	7	6 41 32.87	2.3717	25 25 51.2	0.194
8	4 49 8.98	2.3842	22 35 57.4	7.012	8	6 43 55.11	2.3696	25 25 58.5	+0.051
9	4 51 32.07	2.3854	22 42 53.9	6.871	9	6 46 17.22	2.3674	25 25 57.3	−0.091
10	4 53 55.23	2.3866	22 49 41.9	6.730	10	6 48 39.20	2.3652	25 25 47.6	0.233
11	4 56 18.46	2.3878	22 56 21.5	6.589	11	6 51 1.04	2.3628	25 25 29.3	0.375
12	4 58 41.77	2.3890	23 2 52.6	6.447	12	6 53 22.73	2.3603	25 25 2.6	0.516
13	5 1 5.14	2.3901	23 9 15.2	6.305	13	6 55 44.28	2.3578	25 24 27.4	0.657
14	5 3 28.58	2.3912	23 15 29.2	6.162	14	6 58 5.67	2.3553	25 23 43.8	0.797
15	5 5 52.08	2.3921	23 21 34.7	6.020	15	7 0 26.91	2.3527	25 22 51.7	0.937
16	5 8 15.63	2.3929	23 27 31.6	5.876	16	7 2 47.99	2.3499	25 21 51.3	1.077
17	5 10 39.23	2.3938	23 33 19.8	5.732	17	7 5 8.90	2.3471	25 20 42.5	1.216
18	5 13 2.88	2.3946	23 38 59.4	5.588	18	7 7 29.64	2.3442	25 19 25.4	1.354
19	5 15 26.58	2.3952	23 44 30.4	5.444	19	7 9 50.21	2.3413	25 18 0.0	1.492
20	5 17 50.31	2.3958	23 49 52.7	5.300	20	7 12 10.60	2.3383	25 16 26.4	1.629
21	5 20 14.08	2.3965	23 55 6.4	5.155	21	7 14 30.81	2.3352	25 14 44.5	1.767
22	5 22 37.89	2.3970	24 0 11.3	5.009	22	7 16 50.83	2.3322	25 12 54.4	1.902
23	5 25 1.72	2.3974	24 5 7.5	4.864	23	7 19 10.67	2.3290	25 10 56.2	2.037
24	5 27 25.58	2.3978	N.24 9 55.0	4.718	24	7 21 30.31	2.3257	N.25 8 49.9	2.172

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	THURSDAY 9.					SATURDAY 11.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	7 21 30.31	2.3257	N.25 8 49.9	2.172	0	9 8 25.68	2.1169	N.21 3 18.3	7.731
1	7 23 49.75	2.3223	25 6 35.5	2.307	1	9 10 32.55	2.1121	20 55 31.6	7.825
2	7 26 8.99	2.3189	25 4 13.0	2.441	2	9 12 39.13	2.1072	20 47 39.3	7.918
3	7 28 28.02	2.3155	25 1 42.6	2.573	3	9 14 45.42	2.1023	20 39 41.4	8.011
4	7 30 46.85	2.3120	24 59 4.2	2.706	4	9 16 51.42	2.0975	20 31 38.0	8.102
5	7 33 5.46	2.3083	24 56 17.9	2.837	5	9 18 57.12	2.0927	20 23 29.2	8.191
6	7 35 23.85	2.3047	24 53 23.7	2.969	6	9 21 2.53	2.0878	20 15 15.1	8.280
7	7 37 42.03	2.3011	24 50 21.6	3.099	7	9 23 7.66	2.0830	20 6 55.6	8.369
8	7 39 59.98	2.2973	24 47 11.8	3.228	8	9 25 12.50	2.0782	19 58 30.8	8.456
9	7 42 17.71	2.2935	24 43 54.2	3.357	9	9 27 17.05	2.0735	19 50 0.9	8.542
10	7 44 35.20	2.2896	24 40 28.9	3.486	10	9 29 21.31	2.0687	19 41 25.8	8.627
11	7 46 52.46	2.2857	24 36 55.9	3.613	11	9 31 25.29	2.0639	19 32 45.6	8.712
12	7 49 9.49	2.2818	24 33 15.3	3.740	12	9 33 28.98	2.0592	19 24 0.4	8.795
13	7 51 26.28	2.2777	24 29 27.1	3.866	13	9 35 32.39	2.0544	19 15 10.2	8.877
14	7 53 42.82	2.2737	24 25 31.4	3.990	14	9 37 35.51	2.0496	19 6 15.1	8.959
15	7 55 59.12	2.2696	24 21 28.3	4.114	15	9 39 38.34	2.0449	18 57 15.1	9.040
16	7 58 15.17	2.2654	24 17 17.7	4.238	16	9 41 40.90	2.0403	18 48 10.3	9.119
17	8 0 30.97	2.2612	24 12 59.7	4.362	17	9 43 43.18	2.0356	18 39 0.8	9.198
18	8 2 46.52	2.2570	24 8 34.3	4.483	18	9 45 45.17	2.0309	18 29 46.6	9.276
19	8 5 1.81	2.2527	24 4 1.7	4.604	19	9 47 46.89	2.0263	18 20 27.7	9.352
20	8 7 16.84	2.2483	23 59 21.8	4.725	20	9 49 48.33	2.0217	18 11 4.3	9.427
21	8 9 31.61	2.2440	23 54 34.7	4.844	21	9 51 49.50	2.0172	18 1 36.4	9.502
22	8 11 46.12	2.2396	23 49 40.5	4.962	22	9 53 50.39	2.0125	17 52 4.0	9.577
23	8 14 0.36	2.2352	N.23 44 39.2	5.080	23	9 55 51.00	2.0080	N.17 42 27.2	9.650
	FRIDAY 10.					SUNDAY 12.			
0	8 16 14.34	2.2307	N.23 39 30.9	5.197	0	9 57 51.35	2.0036	N.17 32 46.0	9.722
1	8 18 28.05	2.2262	23 34 15.6	5.313	1	9 59 51.43	1.9991	17 23 0.6	9.792
2	8 20 41.48	2.2216	23 28 53.3	5.428	2	10 1 51.24	1.9946	17 13 10.9	9.863
3	8 22 54.64	2.2171	23 23 24.2	5.542	3	10 3 50.78	1.9902	17 3 17.0	9.932
4	8 25 7.53	2.2125	23 17 48.2	5.656	4	10 5 50.06	1.9857	16 53 19.0	10.000
5	8 27 20.14	2.2079	23 12 5.5	5.768	5	10 7 49.07	1.9814	16 43 17.0	10.068
6	8 29 32.48	2.2032	23 6 16.0	5.881	6	10 9 47.83	1.9772	16 33 10.9	10.135
7	8 31 44.53	2.1985	23 0 19.8	5.991	7	10 11 46.33	1.9728	16 23 0.8	10.200
8	8 33 56.30	2.1938	22 54 17.1	6.100	8	10 13 44.57	1.9685	16 12 46.9	10.264
9	8 36 7.79	2.1892	22 48 7.8	6.209	9	10 15 42.55	1.9642	16 2 29.1	10.328
10	8 38 19.00	2.1844	22 41 52.0	6.317	10	10 17 40.28	1.9602	15 52 7.5	10.391
11	8 40 29.92	2.1797	22 35 29.7	6.425	11	10 19 37.76	1.9560	15 41 42.2	10.452
12	8 42 40.56	2.1749	22 29 1.0	6.531	12	10 21 35.00	1.9518	15 31 13.2	10.513
13	8 44 50.91	2.1701	22 22 26.0	6.636	13	10 23 31.99	1.9477	15 20 40.6	10.573
14	8 47 0.97	2.1653	22 15 44.7	6.741	14	10 25 28.73	1.9437	15 10 4.4	10.633
15	8 49 10.75	2.1606	22 8 57.1	6.844	15	10 27 25.23	1.9397	14 59 24.6	10.692
16	8 51 20.24	2.1557	22 2 3.4	6.946	16	10 29 21.50	1.9357	14 48 41.4	10.748
17	8 53 29.44	2.1508	21 55 3.6	7.047	17	10 31 17.53	1.9318	14 37 54.8	10.804
18	8 55 38.35	2.1461	21 47 57.7	7.148	18	10 33 13.32	1.9279	14 27 4.9	10.860
19	8 57 46.96	2.1412	21 40 45.8	7.248	19	10 35 8.88	1.9241	14 16 11.6	10.916
20	8 59 55.28	2.1363	21 33 27.9	7.347	20	10 37 4.21	1.9202	14 5 15.0	10.969
21	9 2 3.31	2.1315	21 26 4.2	7.443	21	10 38 59.31	1.9165	13 54 15.3	11.022
22	9 4 11.06	2.1267	21 18 34.7	7.541	22	10 40 54.19	1.9128	13 43 12.4	11.074
23	9 6 18.52	2.1218	21 10 59.3	7.637	23	10 42 48.85	1.9091	13 32 6.4	11.125
24	9 8 25.68	2.1169	N.21 3 18.3	7.731	24	10 44 43.28	1.9054	N.13 20 57.4	11.175

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	MONDAY 13.					WEDNESDAY 15.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	10 44 43.28	1.9054	N. 13 20 57.4	11.175	0	12 12 54.16	1.7887	N. 3 42 19.1	12.631
1	10 46 37.50	1.9018	13 9 45.4	11.225	1	12 14 41.45	1.7876	3 29 40.9	12.642
2	10 48 31.50	1.8982	12 58 30.4	11.273	2	12 16 28.67	1.7865	3 17 2.0	12.653
3	10 50 25.29	1.8947	12 47 12.6	11.321	3	12 18 15.83	1.7855	3 4 22.5	12.663
4	10 52 18.87	1.8913	12 35 51.9	11.368	4	12 20 2.93	1.7846	2 51 42.4	12.672
5	10 54 12.25	1.8879	12 24 28.4	11.414	5	12 21 49.98	1.7837	2 39 1.8	12.681
6	10 56 5.42	1.8845	12 13 2.2	11.459	6	12 23 36.98	1.7829	2 26 20.7	12.689
7	10 57 58.39	1.8812	12 1 33.3	11.503	7	12 25 23.93	1.7821	2 13 39.1	12.697
8	10 59 51.16	1.8779	11 50 1.8	11.547	8	12 27 10.83	1.7813	2 0 57.1	12.703
9	11 1 43.74	1.8747	11 38 27.7	11.589	9	12 28 57.69	1.7807	1 48 14.7	12.709
10	11 3 36.12	1.8714	11 26 51.0	11.631	10	12 30 44.51	1.7801	1 35 32.0	12.714
11	11 5 28.31	1.8683	11 15 11.9	11.672	11	12 32 31.30	1.7796	1 22 49.0	12.719
12	11 7 20.32	1.8652	11 3 30.4	11.712	12	12 34 18.06	1.7791	1 10 5.7	12.722
13	11 9 12.14	1.8622	10 51 46.5	11.752	13	12 36 4.79	1.7787	0 57 22.3	12.725
14	11 11 3.79	1.8592	10 40 0.2	11.791	14	12 37 51.49	1.7782	0 44 38.7	12.727
15	11 12 55.25	1.8562	10 28 11.6	11.828	15	12 39 38.17	1.7779	0 31 55.0	12.728
16	11 14 46.54	1.8534	10 16 20.8	11.865	16	12 41 24.84	1.7777	0 19 11.3	12.729
17	11 16 37.66	1.8506	10 4 27.8	11.901	17	12 43 11.50	1.7774	N. 0 6 27.5	12.730
18	11 18 28.61	1.8478	9 52 32.7	11.936	18	12 44 58.15	1.7773	S. 0 6 16.3	12.729
19	11 20 19.40	1.8451	9 40 35.5	11.971	19	12 46 44.79	1.7773	0 19 0.0	12.728
20	11 22 10.02	1.8423	9 28 36.2	12.005	20	12 48 31.42	1.7772	0 31 43.7	12.727
21	11 24 0.48	1.8397	9 16 34.9	12.037	21	12 50 18.05	1.7772	0 44 27.2	12.723
22	11 25 50.79	1.8372	9 4 31.7	12.069	22	12 52 4.68	1.7773	0 57 10.5	12.720
23	11 27 40.94	1.8346	N. 8 52 26.6	12.100	23	12 53 51.33	1.7775	S. 1 9 53.6	12.716
	TUESDAY 14.					THURSDAY 16.			
0	11 29 30.94	1.8322	N. 8 40 19.7	12.130	0	12 55 37.98	1.7777	S. 1 22 36.4	12.711
1	11 31 20.80	1.8297	8 28 11.0	12.160	1	12 57 24.65	1.7779	1 35 18.9	12.706
2	11 33 10.51	1.8273	8 16 0.5	12.189	2	12 59 11.33	1.7782	1 48 1.1	12.700
3	11 35 0.08	1.8250	8 3 48.3	12.217	3	13 0 58.04	1.7787	2 0 42.9	12.692
4	11 36 49.51	1.8227	7 51 34.5	12.244	4	13 2 44.77	1.7791	2 13 24.2	12.685
5	11 38 38.81	1.8205	7 39 19.0	12.271	5	13 4 31.53	1.7796	2 26 5.1	12.677
6	11 40 27.97	1.8183	7 27 2.0	12.296	6	13 6 18.32	1.7801	2 38 45.5	12.668
7	11 42 17.01	1.8162	7 14 43.5	12.321	7	13 8 5.14	1.7807	2 51 25.3	12.658
8	11 44 5.92	1.8142	7 2 23.5	12.346	8	13 9 52.00	1.7813	3 4 4.5	12.648
9	11 45 54.71	1.8122	6 50 2.0	12.369	9	13 11 38.90	1.7821	3 16 43.1	12.637
10	11 47 43.38	1.8102	6 37 39.2	12.392	10	13 13 25.85	1.7829	3 29 21.0	12.626
11	11 49 31.94	1.8083	6 25 15.0	12.414	11	13 15 12.85	1.7837	3 41 58.2	12.613
12	11 51 20.38	1.8064	6 12 49.5	12.435	12	13 16 59.90	1.7847	3 54 34.6	12.600
13	11 53 8.71	1.8047	6 0 22.8	12.456	13	13 18 47.01	1.7856	4 7 10.2	12.586
14	11 54 56.94	1.8030	5 47 54.8	12.476	14	13 20 34.17	1.7866	4 19 44.9	12.572
15	11 56 45.07	1.8013	5 35 25.7	12.494	15	13 22 21.40	1.7877	4 32 18.8	12.557
16	11 58 33.10	1.7997	5 22 55.5	12.512	16	13 24 8.69	1.7887	4 44 51.7	12.541
17	12 0 21.03	1.7981	5 10 24.2	12.530	17	13 25 56.05	1.7900	4 57 23.7	12.525
18	12 2 8.87	1.7966	4 57 51.9	12.547	18	13 27 43.49	1.7913	5 9 54.7	12.507
19	12 3 56.62	1.7952	4 45 18.6	12.562	19	13 29 31.01	1.7926	5 22 24.5	12.488
20	12 5 44.29	1.7937	4 32 44.4	12.577	20	13 31 18.60	1.7939	5 34 53.3	12.470
21	12 7 31.87	1.7923	4 20 9.3	12.592	21	13 33 6.28	1.7954	5 47 20.9	12.451
22	12 9 19.37	1.7911	4 7 33.3	12.606	22	13 34 54.05	1.7969	5 59 47.4	12.431
23	12 11 6.80	1.7899	3 54 56.6	12.618	23	13 36 41.91	1.7984	6 12 12.6	12.409
24	12 12 54.16	1.7887	N. 3 42 19.1	12.631	24	13 38 29.86	1.8000	S. 6 24 36.5	12.387

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
FRIDAY 17.					SUNDAY 19.				
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	13 38 29.86	1.8000	S. 6 24 36.5	12.387	0	15 7 49.63	1.9432	S. 15 40 25.2	10.475
1	13 40 17.91	1.8017	6 36 59.1	12.365	1	15 9 46.35	1.9474	15 50 51.9	10.416
2	13 42 6.06	1.8034	6 49 20.3	12.342	2	15 11 43.32	1.9517	16 1 15.1	10.356
3	13 43 54.32	1.8052	7 1 40.1	12.318	3	15 13 40.56	1.9562	16 11 34.6	10.294
4	13 45 42.68	1.8070	7 13 58.5	12.294	4	15 15 38.06	1.9605	16 21 50.4	10.232
5	13 47 31.16	1.8089	7 26 15.4	12.269	5	15 17 35.82	1.9649	16 32 2.5	10.169
6	13 49 19.75	1.8108	7 38 30.8	12.243	6	15 19 33.85	1.9695	16 42 10.7	10.105
7	13 51 8.46	1.8128	7 50 44.6	12.217	7	15 21 32.16	1.9741	16 52 15.1	10.041
8	13 52 57.29	1.8149	8 2 56.8	12.189	8	15 23 30.74	1.9786	17 2 15.6	9.976
9	13 54 46.25	1.8171	8 15 7.3	12.162	9	15 25 29.59	1.9832	17 12 12.2	9.909
10	13 56 35.34	1.8192	8 27 16.2	12.133	10	15 27 28.72	1.9879	17 22 4.7	9.842
11	13 58 24.56	1.8215	8 39 23.3	12.103	11	15 29 28.14	1.9927	17 31 53.2	9.773
12	14 0 13.92	1.8238	8 51 28.6	12.073	12	15 31 27.84	1.9974	17 41 37.5	9.704
13	14 2 3.42	1.8261	9 3 32.1	12.042	13	15 33 27.83	2.0022	17 51 17.7	9.634
14	14 3 53.06	1.8285	9 15 33.7	12.010	14	15 35 28.10	2.0069	18 0 53.6	9.563
15	14 5 42.84	1.8310	9 27 33.3	11.977	15	15 37 28.66	2.0118	18 10 25.3	9.492
16	14 7 32.77	1.8335	9 39 31.0	11.945	16	15 39 29.52	2.0168	18 19 52.6	9.418
17	14 9 22.86	1.8361	9 51 26.7	11.912	17	15 41 30.68	2.0217	18 29 15.5	9.344
18	14 11 13.10	1.8387	10 3 20.4	11.877	18	15 43 32.13	2.0267	18 38 33.9	9.269
19	14 13 3.50	1.8414	10 15 12.0	11.842	19	15 45 33.88	2.0317	18 47 47.8	9.194
20	14 14 54.07	1.8442	10 27 1.4	11.805	20	15 47 35.94	2.0368	18 56 57.2	9.118
21	14 16 44.81	1.8470	10 38 48.6	11.767	21	15 49 38.30	2.0418	19 6 2.0	9.040
22	14 18 35.71	1.8498	10 50 33.5	11.730	22	15 51 40.96	2.0469	19 15 2.0	8.961
23	14 20 26.79	1.8527	S. 11 2 16.2	11.692	23	15 53 43.93	2.0521	S. 19 23 57.3	8.882
SATURDAY 18.					MONDAY 20.				
0	14 22 18.04	1.8557	S. 11 13 56.6	11.653	0	15 55 47.21	2.0572	S. 19 32 47.8	8.801
1	14 24 9.47	1.8587	11 25 34.6	11.613	1	15 57 50.80	2.0625	19 41 33.4	8.719
2	14 26 1.09	1.8619	11 37 10.2	11.572	2	15 59 54.71	2.0677	19 50 14.1	8.637
3	14 27 52.90	1.8650	11 48 43.3	11.531	3	16 1 58.93	2.0730	19 58 49.9	8.554
4	14 29 44.90	1.8682	12 0 13.9	11.489	4	16 4 3.47	2.0782	20 7 20.6	8.469
5	14 31 37.08	1.8714	12 11 42.0	11.447	5	16 6 8.32	2.0836	20 15 46.2	8.384
6	14 33 29.46	1.8747	12 23 7.5	11.402	6	16 8 13.50	2.0889	20 24 6.7	8.298
7	14 35 22.05	1.8782	12 34 30.3	11.357	7	16 10 18.99	2.0942	20 32 22.0	8.211
8	14 37 14.84	1.8815	12 45 50.4	11.312	8	16 12 24.81	2.0997	20 40 32.0	8.122
9	14 39 7.83	1.8849	12 57 7.7	11.266	9	16 14 30.95	2.1050	20 48 36.7	8.033
10	14 41 1.03	1.8885	13 8 22.3	11.219	10	16 16 37.41	2.1104	20 56 36.0	7.942
11	14 42 54.45	1.8921	13 19 34.0	11.171	11	16 18 44.20	2.1159	21 4 29.8	7.851
12	14 44 48.08	1.8957	13 30 42.8	11.122	12	16 20 51.32	2.1214	21 12 18.1	7.759
13	14 46 41.93	1.8994	13 41 48.7	11.073	13	16 22 58.77	2.1268	21 20 0.9	7.666
14	14 48 36.00	1.9031	13 52 51.6	11.022	14	16 25 6.54	2.1322	21 27 38.0	7.571
15	14 50 30.30	1.9069	14 3 51.4	10.972	15	16 27 14.64	2.1377	21 35 9.4	7.476
16	14 52 24.83	1.9107	14 14 48.2	10.920	16	16 29 23.07	2.1433	21 42 35.1	7.380
17	14 54 19.59	1.9146	14 25 41.8	10.867	17	16 31 31.83	2.1488	21 49 55.0	7.283
18	14 56 14.58	1.9185	14 36 32.2	10.813	18	16 33 40.93	2.1543	21 57 9.1	7.185
19	14 58 9.81	1.9225	14 47 19.4	10.760	19	16 35 50.36	2.1598	22 4 17.2	7.085
20	15 0 5.28	1.9266	14 58 3.4	10.705	20	16 38 0.11	2.1653	22 11 19.3	6.984
21	15 2 1.00	1.9307	15 8 44.0	10.648	21	16 40 10.20	2.1709	22 18 15.3	6.883
22	15 3 56.96	1.9347	15 19 21.2	10.591	22	16 42 20.62	2.1764	22 25 5.3	6.782
23	15 5 53.17	1.9389	15 29 54.9	10.533	23	16 44 31.37	2.1820	22 31 49.1	6.678
24	15 7 49.63	1.9432	S. 15 40 25.2	10.475	24	16 46 42.46	2.1876	S. 22 38 26.6	6.572

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	TUESDAY 21.					**THURSDAY 23.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	16 46 42.46	2.1876	S. 22 38 26.6	6.572	0	18 37 41.69	2.4204	S. 25 34 39.5	0.413
1	16 48 53.88	2.1931	22 44 57.8	6.467	1	18 40 7.02	2.4239	25 34 59.8	0.264
2	16 51 5.63	2.1987	22 51 22.7	6.361	2	18 42 32.56	2.4273	25 35 11.2	−0.114
3	16 53 17.72	2.2042	22 57 41.1	6.253	3	18 44 58.30	2.4307	25 35 13.5	+0.037
4	16 55 30.14	2.2097	23 3 53.0	6.144	4	18 47 24.24	2.4339	25 35 6.8	0.187
5	16 57 42.89	2.2152	23 9 58.4	6.035	5	18 49 50.37	2.4370	25 34 51.0	0.339
6	16 59 55.97	2.2207	23 15 57.2	5.925	6	18 52 16.68	2.4400	25 34 26.1	0.492
7	17 2 9.38	2.2262	23 21 49.4	5.813	7	18 54 43.17	2.4430	25 33 52.0	0.644
8	17 4 23.12	2.2317	23 27 34.8	5.700	8	18 57 9.84	2.4458	25 33 8.8	0.797
9	17 6 37.19	2.2372	23 33 13.4	5.586	9	18 59 36.68	2.4487	25 32 16.3	0.952
10	17 8 51.58	2.2426	23 38 45.1	5.472	10	19 2 3.68	2.4514	25 31 14.6	1.106
11	17 11 6.30	2.2481	23 44 10.0	5.357	11	19 4 30.84	2.4539	25 30 3.6	1.261
12	17 13 21.35	2.2535	23 49 27.9	5.240	12	19 6 58.15	2.4564	25 28 43.3	1.416
13	17 15 36.72	2.2589	23 54 38.8	5.122	13	19 9 25.61	2.4589	25 27 13.7	1.572
14	17 17 52.42	2.2643	23 59 42.5	5.002	14	19 11 53.22	2.4612	25 25 34.7	1.727
15	17 20 8.44	2.2697	24 4 39.1	4.883	15	19 14 20.96	2.4635	25 23 46.3	1.884
16	17 22 24.78	2.2750	24 9 28.5	4.762	16	19 16 48.84	2.4657	25 21 48.6	2.041
17	17 24 41.44	2.2802	24 14 10.6	4.641	17	19 19 16.84	2.4677	25 19 41.5	2.197
18	17 26 58.41	2.2855	24 18 45.4	4.518	18	19 21 44.96	2.4696	25 17 24.9	2.356
19	17 29 15.70	2.2907	24 23 12.8	4.395	19	19 24 13.19	2.4715	25 14 58.8	2.514
20	17 31 33.30	2.2959	24 27 32.8	4.270	20	19 26 41.53	2.4732	25 12 23.2	2.672
21	17 33 51.21	2.3011	24 31 45.2	4.144	21	19 29 9.97	2.4748	25 9 38.2	2.830
22	17 36 9.43	2.3062	24 35 50.1	4.017	22	19 31 38.51	2.4764	25 6 43.7	2.987
23	17 38 27.96	2.3113	S. 24 39 47.3	3.889	23	19 34 7.14	2.4779	S. 25 3 39.7	3.147
	WEDNESDAY 22.					**FRIDAY 24.**			
0	17 40 46.79	2.3163	S. 24 43 36.8	3.761	0	19 36 35.86	2.4793	S. 25 0 26.1	3.306
1	17 43 5.92	2.3213	24 47 18.6	3.632	1	19 39 4.66	2.4806	24 57 3.0	3.465
2	17 45 25.35	2.3262	24 50 52.6	3.501	2	19 41 33.53	2.4817	24 53 30.3	3.624
3	17 47 45.07	2.3312	24 54 18.7	3.369	3	19 44 2.46	2.4827	24 49 48.1	3.783
4	17 50 5.09	2.3361	24 57 36.9	3.237	4	19 46 31.46	2.4838	24 45 56.3	3.943
5	17 52 25.40	2.3408	25 0 47.2	3.104	5	19 49 0.52	2.4847	24 41 54.9	4.102
6	17 54 45.99	2.3456	25 3 49.5	2.970	6	19 51 29.63	2.4855	24 37 44.0	4.262
7	17 57 6.87	2.3503	25 6 43.7	2.835	7	19 53 58.78	2.4862	24 33 23.5	4.422
8	17 59 28.03	2.3549	25 9 29.7	2.698	8	19 56 27.97	2.4868	24 28 53.4	4.581
9	18 1 49.46	2.3595	25 12 7.5	2.562	9	19 58 57.20	2.4874	24 24 13.8	4.740
10	18 4 11.17	2.3641	25 14 37.1	2.425	10	20 1 26.46	2.4878	24 19 24.6	4.900
11	18 6 33.15	2.3686	25 16 58.4	2.286	11	20 3 55.74	2.4882	24 14 25.8	5.059
12	18 8 55.40	2.3730	25 19 11.4	2.147	12	20 6 25.04	2.4884	24 9 17.5	5.217
13	18 11 17.91	2.3773	25 21 16.0	2.007	13	20 8 54.35	2.4886	24 3 59.7	5.377
14	18 13 40.68	2.3816	25 23 12.2	1.866	14	20 11 23.67	2.4887	23 58 32.3	5.537
15	18 16 3.70	2.3858	25 24 59.9	1.723	15	20 13 52.99	2.4887	23 52 55.3	5.695
16	18 18 26.98	2.3900	25 26 39.0	1.581	16	20 16 22.31	2.4885	23 47 8.9	5.852
17	18 20 50.50	2.3941	25 28 9.6	1.437	17	20 18 51.61	2.4882	23 41 13.0	6.011
18	18 23 14.27	2.3981	25 29 31.5	1.293	18	20 21 20.90	2.4880	23 35 7.6	6.168
19	18 25 38.27	2.4019	25 30 44.8	1.149	19	20 23 50.17	2.4877	23 28 52.8	6.326
20	18 28 2.50	2.4058	25 31 49.4	1.003	20	20 26 19.42	2.4872	23 22 28.5	6.483
21	18 30 26.97	2.4097	25 32 45.2	0.856	21	20 28 48.64	2.4867	23 15 54.8	6.640
22	18 32 51.66	2.4133	25 33 32.1	0.708	22	20 31 17.83	2.4861	23 9 11.7	6.797
23	18 35 16.57	2.4169	25 34 10.2	0.562	23	20 33 46.97	2.4853	23 2 19.2	6.952
24	18 37 41.69	2.4204	S. 25 34 39.5	0.413	24	20 36 16.07	2.4846	S. 22 55 17.4	7.107

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	SATURDAY 25.					**MONDAY 27.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	20 36 16.07	2.4846	S. 22 55 17.4	7.107	0	22 33 31.95	2.3878	S. 14 29 40.5	13.547
1	20 38 45.12	2.4837	22 48 6.3	7.262	1	22 35 55.14	2.3853	14 16 4.5	13.651
2	20 41 14.11	2.4827	22 40 45.9	7.417	2	22 38 18.18	2.3828	14 2 22.4	13.752
3	20 43 43.05	2.4818	22 33 16.2	7.572	3	22 40 41.08	2.3803	13 48 34.2	13.852
4	20 46 11.93	2.4807	22 25 37.3	7.725	4	22 43 3.83	2.3779	13 34 40.1	13.951
5	20 48 40.74	2.4795	22 17 49.2	7.877	5	22 45 26.43	2.3754	13 20 40.1	14.048
6	20 51 9.48	2.4783	22 9 52.0	8.029	6	22 47 48.88	2.3730	13 6 34.3	14.144
7	20 53 38.14	2.4771	22 1 45.7	8.181	7	22 50 11.19	2.3706	12 52 22.8	14.237
8	20 56 6.72	2.4757	21 53 30.3	8.332	8	22 52 33.35	2.3682	12 38 5.8	14.329
9	20 58 35.22	2.4743	21 45 5.8	8.483	9	22 54 55.37	2.3658	12 23 43.3	14.420
10	21 1 3.64	2.4728	21 36 32.3	8.632	10	22 57 17.25	2.3635	12 9 15.4	14.509
11	21 3 31.96	2.4712	21 27 49.9	8.781	11	22 59 38.99	2.3612	11 54 42.2	14.596
12	21 6 0.19	2.4697	21 18 58.6	8.929	12	23 2 0.59	2.3588	11 40 3.9	14.680
13	21 8 28.32	2.4680	21 9 58.4	9.076	13	23 4 22.05	2.3566	11 25 20.6	14.763
14	21 10 56.35	2.4663	21 0 49.4	9.222	14	23 6 43.38	2.3544	11 10 32.3	14.845
15	21 13 24.28	2.4645	20 51 31.7	9.368	15	23 9 4.58	2.3522	10 55 39.2	14.925
16	21 15 52.10	2.4627	20 42 5.2	9.513	16	23 11 25.64	2.3500	10 40 41.3	15.003
17	21 18 19.80	2.4608	20 32 30.1	9.657	17	23 13 46.58	2.3479	10 25 38.8	15.079
18	21 20 47.39	2.4589	20 22 46.4	9.800	18	23 16 7.39	2.3457	10 10 31.8	15.153
19	21 23 14.86	2.4569	20 12 54.1	9.942	19	23 18 28.07	2.3437	9 55 20.4	15.226
20	21 25 42.22	2.4549	20 2 53.3	10.083	20	23 20 48.63	2.3416	9 40 4.7	15.297
21	21 28 9.46	2.4529	19 52 44.1	10.223	21	23 23 9.06	2.3396	9 24 44.7	15.367
22	21 30 36.57	2.4507	19 42 26.5	10.362	22	23 25 29.38	2.3377	9 9 20.7	15.433
23	21 33 3.55	2.4486	S. 19 32 0.6	10.500	23	23 27 49.58	2.3357	S. 8 53 52.7	15.498
	SUNDAY 26.					**TUESDAY 28.**			
0	21 35 30.40	2.4464	S. 19 21 26.5	10.637	0	23 30 9.67	2.3338	S. 8 38 20.9	15.561
1	21 37 57.12	2.4442	19 10 44.2	10.772	1	23 32 29.64	2.3320	8 22 45.4	15.622
2	21 40 23.71	2.4420	18 59 53.8	10.907	2	23 34 49.51	2.3302	8 7 6.2	15.683
3	21 42 50.16	2.4397	18 48 55.3	11.042	3	23 37 9.27	2.3285	7 51 23.4	15.741
4	21 45 16.47	2.4373	18 37 48.8	11.174	4	23 39 28.93	2.3267	7 35 37.3	15.796
5	21 47 42.64	2.4350	18 26 34.4	11.305	5	23 41 48.48	2.3251	7 19 47.9	15.849
6	21 50 8.67	2.4327	18 15 12.2	11.434	6	23 44 7.94	2.3235	7 3 55.4	15.901
7	21 52 34.56	2.4303	18 3 42.3	11.563	7	23 46 27.30	2.3219	6 47 59.8	15.952
8	21 55 0.31	2.4279	17 52 4.6	11.692	8	23 48 46.57	2.3204	6 32 1.2	16.000
9	21 57 25.91	2.4255	17 40 19.3	11.818	9	23 51 5.75	2.3189	6 15 59.8	16.046
10	21 59 51.36	2.4230	17 28 26.5	11.942	10	23 53 24.84	2.3174	5 59 55.7	16.090
11	22 2 16.67	2.4205	17 16 26.2	12.067	11	23 55 43.84	2.3161	5 43 49.0	16.132
12	22 4 41.83	2.4181	17 4 18.5	12.189	12	23 58 2.77	2.3148	5 27 39.9	16.172
13	22 7 6.84	2.4156	16 52 3.5	12.310	13	0 0 21.62	2.3136	5 11 28.4	16.211
14	22 9 31.70	2.4131	16 39 41.3	12.430	14	0 2 40.40	2.3123	4 55 14.6	16.247
15	22 11 56.41	2.4105	16 27 11.9	12.548	15	0 4 59.10	2.3112	4 38 58.7	16.281
16	22 14 20.97	2.4080	16 14 35.5	12.665	16	0 7 17.74	2.3101	4 22 40.9	16.313
17	22 16 45.37	2.4055	16 1 52.1	12.780	17	0 9 36.31	2.3090	4 6 21.2	16.343
18	22 19 9.62	2.4029	15 49 1.9	12.894	18	0 11 54.82	2.3080	3 49 59.7	16.372
19	22 21 33.72	2.4004	15 36 4.8	13.007	19	0 14 13.27	2.3071	3 33 36.5	16.398
20	22 23 57.67	2.3979	15 23 1.0	13.118	20	0 16 31.67	2.3062	3 17 11.9	16.422
21	22 26 21.47	2.3953	15 9 50.6	13.228	21	0 18 50.01	2.3053	3 0 45.9	16.444
22	22 28 45.12	2.3928	14 56 33.6	13.337	22	0 21 8.31	2.3047	2 44 18.6	16.465
23	22 31 8.61	2.3903	14 43 10.2	13.442	23	0 23 26.57	2.3039	2 27 50.1	16.483
24	22 33 31.95	2.3878	S. 14 29 40.5	13.547	24	0 25 44.78	2.3032	S. 2 11 20.6	16.500

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	WEDNESDAY 29.			
	h m s	s	° ′ ″	″
0	0 25 44.78	2.3032	S. 2 11 20.6	16.500
1	0 28 2.96	2.3027	1 54 50.1	16.514
2	0 30 21.10	2.3021	1 38 18.9	16.526
3	0 32 39.21	2.3016	1 21 47.0	16.536
4	0 34 57.29	2.3012	1 5 14.6	16.544
5	0 37 15.35	2.3007	0 48 41.7	16.551
6	0 39 33.38	2.3004	0 32 8.5	16.555
7	0 41 51.40	2.3002	S. 0 15 35.1	16.557
8	0 44 9.41	2.3001	N. 0 0 58.3	16.557
9	0 46 27.41	2.2999	0 17 31.7	16.555
10	0 48 45.40	2.2998	0 34 4.9	16.551
11	0 51 3.39	2.2998	0 50 37.8	16.545
12	0 53 21.38	2.2998	1 7 10.3	16.537
13	0 55 39.37	2.2999	1 23 42.3	16.527
14	0 57 57.37	2.3001	1 40 13.6	16.515
15	1 0 15.38	2.3003	1 56 44.1	16.501
16	1 2 33.41	2.3007	2 13 13.7	16.485
17	1 4 51.46	2.3009	2 29 42.3	16.467
18	1 7 9.52	2.3012	2 46 9.8	16.447
19	1 9 27.61	2.3017	3 2 36.0	16.426
20	1 11 45.73	2.3022	3 19 0.9	16.402
21	1 14 3.88	2.3028	3 35 24.3	16.376
22	1 16 22.07	2.3034	3 51 46.0	16.347
23	1 18 40.29	2.3041	N. 4 8 6.0	16.318
	THURSDAY 30.			
0	1 20 58.56	2.3048	N. 4 24 24.2	16.287
1	1 23 16.87	2.3056	4 40 40.4	16.252
2	1 25 35.23	2.3065	4 56 54.5	16.217
3	1 27 53.65	2.3074	5 13 6.4	16.179
4	1 30 12.12	2.3083	5 29 16.0	16.140
5	1 32 30.65	2.3093	5 45 23.2	16.099
6	1 34 49.24	2.3103	6 1 27.9	16.056
7	1 37 7.89	2.3114	6 17 29.9	16.010
8	1 39 26.61	2.3126	6 33 29.1	15.962
9	1 41 45.40	2.3138	6 49 25.4	15.913
10	1 44 4.27	2.3151	7 5 18.7	15.862
11	1 46 23.21	2.3163	7 21 8.9	15.810
12	1 48 42.23	2.3177	7 36 55.9	15.755
13	1 51 1.33	2.3191	7 52 39.5	15.698
14	1 53 20.52	2.3206	8 8 19.7	15.640
15	1 55 39.80	2.3221	8 23 56.3	15.579
16	1 57 59.17	2.3236	8 39 29.2	15.517
17	2 0 18.63	2.3251	8 54 58.3	15.453
18	2 2 38.18	2.3267	9 10 23.6	15.387
19	2 4 57.84	2.3285	9 25 44.8	15.319
20	2 7 17.60	2.3302	9 41 1.9	15.250
21	2 9 37.46	2.3319	9 56 14.8	15.179
22	2 11 57.43	2.3337	10 11 23.4	15.106
23	2 14 17.50	2.3355	10 26 27.5	15.031
24	2 16 37.69	2.3374	N. 10 41 27.1	14.954

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	FRIDAY, OCTOBER 1.			
	h m s	s	° ′ ″	″
0	2 16 37.69	2.3374	N. 10 41 27.1	14.954

PHASES OF THE MOON.

			d	h	m
☾	Last Quarter . . .	Sept.	6	7	44.4
●	New Moon		14	3	8.7
☽	First Quarter		22	6	31.5
○	Full Moon		29	1	5.4

			d	h
☾	Apogee	Sept.	15	21.5
☾	Perigee		29	5.0

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.			P. L. of Diff.	III$^{\text{h}}$			P. L. of Diff.	VI$^{\text{h}}$			P. L. of Diff.	IX$^{\text{h}}$			P. L. of Diff.
			°	′	″		°	′	″		°	′	″		°	′	″	
1	Antares	W.	107	36	57	2023	109	29	55	2026	111	22	48	2030	113	15	36	2034
	α Aquilæ	W.	63	43	31	2985	65	14	2	2960	66	45	5	2938	68	16	37	2918
	Aldebaran	E.	71	32	39	2025	69	39	44	2028	67	46	55	2032	65	54	11	2036
	Pollux	E.	115	39	38	2016	113	46	29	2018	111	53	23	2021	110	0	20	2024
2	*α* Aquilæ	W.	75	59	24	2859	77	32	36	2855	79	5	53	2852	80	39	13	2852
	Fomalhaut	W.	41	32	28	2450	43	14	51	2431	44	57	41	2416	46	40	54	2403
	Aldebaran	E.	56	32	32	2070	54	40	46	2079	52	49	13	2088	50	57	55	2098
	Pollux	E.	100	36	52	2052	98	44	39	2060	96	52	37	2068	95	0	48	2077
3	*α* Aquilæ	W.	88	24	54	2884	89	57	33	2896	91	29	57	2910	93	2	4	2925
	Fomalhaut	W.	55	20	10	2379	57	4	15	2380	58	48	18	2382	60	32	18	2386
	α Pegasi	W.	40	55	15	3175	42	21	54	3115	43	49	45	3064	45	18	39	3019
	Mars	W.	20	47	15	2079	22	38	46	2090	24	30	1	2101	26	20	59	2113
	Aldebaran	E.	41	45	45	2161	39	56	19	2176	38	7	15	2192	36	18	35	2209
	Pollux	E.	85	45	20	2128	83	55	4	2140	82	5	5	2152	80	15	25	2165
	Sun	E.	133	32	56	2448	131	50	29	2459	130	8	17	2470	128	26	22	2482
4	*α* Aquilæ	W.	100	37	7	3026	102	6	48	3052	103	35	57	3078	105	4	33	3106
	Fomalhaut	W.	69	10	18	2423	70	53	20	2434	72	36	6	2444	74	18	38	2455
	α Pegasi	W.	52	54	24	2883	54	27	4	2869	56	0	3	2857	57	33	17	2848
	Mars	W.	35	31	13	2176	37	20	17	2189	39	9	1	2203	40	57	24	2217
	Saturn	W.	18	44	56	2216	20	33	0	2229	22	20	44	2243	24	8	7	2258
	Pollux	E.	71	12	0	2233	69	24	21	2247	67	37	4	2262	65	50	8	2277
	Sun	E.	120	1	14	2550	118	21	10	2565	116	41	27	2580	115	2	5	2595
5	Fomalhaut	W.	82	47	4	2521	84	27	48	2535	86	8	13	2549	87	48	18	2564
	α Pegasi	W.	65	21	16	2837	66	54	56	2840	68	28	32	2843	70	2	4	2848
	Mars	W.	49	54	4	2289	51	40	20	2304	53	26	14	2318	55	11	47	2333
	Saturn	W.	32	59	48	2330	34	45	4	2345	36	29	58	2360	38	14	30	2375
	Pollux	E.	57	1	6	2354	55	16	25	2370	53	32	7	2386	51	48	12	2402
	Sun	E.	106	50	29	2674	105	13	15	2690	103	36	22	2707	101	59	51	2723
6	Fomalhaut	W.	96	3	27	2643	97	41	23	2660	99	18	56	2677	100	56	7	2693
	α Pegasi	W.	77	47	36	2890	79	20	9	2900	80	52	28	2911	82	24	33	2922
	Mars	W.	63	54	11	2406	65	37	37	2421	67	20	42	2435	69	3	26	2449
	Saturn	W.	46	51	46	2450	48	34	9	2465	50	16	10	2480	51	57	50	2495
	α Arietis	W.	34	10	51	2821	35	44	51	2808	37	19	8	2799	38	53	37	2793
	Pollux	E.	43	14	23	2483	41	32	46	2499	39	51	31	2516	38	10	40	2532
	Sun	E.	94	2	43	2805	92	28	22	2821	90	54	22	2838	89	20	43	2854
7	Fomalhaut	W.	108	56	19	2782	110	31	11	2801	112	5	38	2819	113	39	41	2838
	α Pegasi	W.	90	1	5	2989	91	31	32	3003	93	1	41	3018	94	31	32	3034
	Mars	W.	77	32	13	2519	79	13	0	2532	80	53	29	2545	82	33	39	2558
	Saturn	W.	60	21	8	2567	62	0	48	2581	63	40	9	2595	65	19	11	2608
	α Arietis	W.	46	47	11	2791	48	21	51	2795	49	56	26	2799	51	30	56	2804
	Pollux	E.	29	52	7	2617	28	13	35	2635	26	35	27	2653	24	57	44	2673
	Sun	E.	81	37	37	2933	80	6	0	2948	78	34	42	2963	77	3	43	2978
8	*α* Pegasi	W.	101	55	46	3118	103	23	34	3135	104	51	1	3154	106	18	5	3173
	Mars	W.	90	50	10	2620	92	28	37	2632	94	6	49	2643	95	44	45	2655
	Saturn	W.	73	29	53	2672	75	7	10	2685	76	44	10	2697	78	20	54	2709

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.			P. L. of Diff.	XV^{h}			P. L. of Diff.	$\mathrm{XVIII}^{\mathrm{h}}$			P. L. of Diff.	$\mathrm{XXI}^{\mathrm{h}}$			P. L. of Diff.
			°	′	″		°	′	″		°	′	″		°	′	″	
1	Antares	W.	115	8	17	2039	117	0	50	2045	118	53	15	2052	120	45	30	2059
	a Aquilæ	W.	69	48	33	2901	71	20	51	2886	72	53	28	2874	74	26	20	2865
	Aldebaran	E.	64	1	32	2041	62	9	2	2047	60	16	41	2054	58	24	31	2062
	Pollux	E.	108	7	23	2028	106	14	33	2033	104	21	50	2039	102	29	16	2045
2	*a* Aquilæ	W.	82	12	33	2855	83	45	49	2860	85	18	59	2866	86	52	2	2874
	Fomalhaut	W.	48	24	26	2393	50	8	11	2386	51	52	6	2382	53	36	6	2380
	Aldebaran	E.	49	6	53	2109	47	16	8	2121	45	25	41	2134	43	35	33	2147
	Pollux	E.	93	9	12	2086	91	17	51	2096	89	26	45	2106	87	35	54	2116
3	*a* Aquilæ	W.	94	33	51	2942	96	5	17	2961	97	36	19	2981	99	6	57	3002
	Fomalhaut	W.	62	16	12	2392	63	59	58	2398	65	43	36	2405	67	27	3	2414
	a Pegasi	W.	46	48	28	2981	48	19	4	2950	49	50	19	2924	51	22	7	2901
	MARS	W.	28	11	39	2125	30	2	1	2137	31	52	4	2149	33	41	48	2162
	Aldebaran	E.	34	30	21	2227	32	42	34	2247	30	55	16	2267	29	8	28	2288
	Pollux	E.	78	26	4	2178	76	37	3	2191	74	48	22	2204	73	0	1	2218
	SUN	E.	126	44	44	2495	125	3	24	2508	123	22	22	2521	121	41	38	2535
4	*a* Aquilæ	W.	106	32	35	3138	107	59	59	3170	109	26	44	3204	110	52	48	3241
	Fomalhaut	W.	76	0	55	2467	77	42	54	2480	79	24	36	2493	81	6	0	2507
	a Pegasi	W.	59	6	42	2842	60	40	15	2838	62	13	53	2836	63	47	34	2835
	MARS	W.	42	45	27	2231	44	33	8	2245	46	20	28	2260	48	7	27	2274
	SATURN	W.	25	55	9	2272	27	41	50	2286	29	28	11	2300	31	14	10	2315
	Pollux	E.	64	3	35	2292	62	17	24	2308	60	31	36	2323	58	46	10	2338
	SUN	E.	113	23	3	2610	111	44	22	2626	110	6	3	2642	108	28	5	2658
5	Fomalhaut	W.	89	28	3	2580	91	7	26	2595	92	46	28	2611	94	25	8	2627
	a Pegasi	W.	71	35	30	2855	73	8	47	2862	74	41	54	2870	76	14	51	2880
	MARS	W.	56	56	58	2348	58	41	48	2363	60	26	16	2377	62	10	24	2391
	SATURN	W.	39	58	41	2390	41	42	29	2405	43	25	56	2420	45	9	2	2435
	Pollux	E.	50	4	40	2418	48	21	31	2435	46	38	46	2451	44	56	23	2467
	SUN	E.	100	23	42	2740	98	47	55	2756	97	12	29	2772	95	37	25	2789
6	Fomalhaut	W.	102	32	56	2710	104	9	22	2729	105	45	24	2746	107	21	3	2763
	a Pegasi	W.	83	56	24	2935	85	27	59	2948	86	59	18	2961	88	30	20	2974
	MARS	W.	70	45	51	2463	72	27	56	2477	74	9	41	2491	75	51	7	2505
	SATURN	W.	53	39	10	2510	55	20	10	2525	57	0	49	2539	58	41	8	2553
	a Arietis	W.	40	28	14	2788	42	2	57	2787	43	37	42	2787	45	12	27	2788
	Pollux	E.	36	30	11	2548	34	50	5	2565	33	10	22	2582	31	31	3	2599
	SUN	E.	87	47	25	2870	86	14	28	2886	84	41	51	2901	83	9	34	2917
7	Fomalhaut	W.	115	13	19	2857	116	46	32	2877	118	19	21	2897	119	51	44	2917
	a Pegasi	W.	96	1	3	3050	97	30	14	3066	98	59	5	3082	100	27	36	3100
	MARS	W.	84	13	32	2571	85	53	7	2583	87	32	25	2596	89	11	26	2608
	SATURN	W.	66	57	55	2621	68	36	21	2634	70	14	29	2647	71	52	20	2660
	a Arietis	W.	53	5	19	2811	54	39	33	2817	56	13	39	2824	57	47	37	2831
	Pollux	E.	23	20	27	2693	21	43	38	2714	20	7	17	2737	18	31	26	2761
	SUN	E.	75	33	3	2993	74	2	42	3008	72	32	39	3022	71	2	53	3036
8	*a* Pegasi	W.	107	44	46	3193	109	11	3	3214	110	36	55	3235	112	2	23	3255
	MARS	W.	97	22	26	2666	98	59	52	2677	100	37	4	2687	102	14	1	2697
	SATURN	W.	79	57	22	2720	81	33	35	2732	83	9	32	2743	84	45	15	2754

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	$\mathrm{III}^{\mathrm{h}}$	P. L. of Diff.	VI^{h}	P. L. of Diff.	IX^{h}	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
8	α Arietis	W.	59 21 25	2838	60 55 3	2846	62 28 31	2854	64 1 49	2862
	Aldebaran	W.	28 5 23	2766	29 40 35	2772	31 15 40	2778	32 50 37	2784
	Sun	E.	69 33 25	3050	68 4 14	3064	66 35 21	3078	65 6 44	3091
9	Mars	W.	103 50 45	2707	105 27 15	2717	107 3 31	2727	108 39 35	2737
	Saturn	W.	86 20 44	2765	87 55 58	2775	89 30 59	2785	91 5 47	2795
	α Arietis	W.	71 45 40	2904	73 17 54	2913	74 49 56	2921	76 21 48	2930
	Aldebaran	W.	40 43 1	2823	42 16 59	2831	43 50 46	2839	45 24 23	2847
	Sun	E.	57 47 39	3155	56 20 36	3167	54 53 47	3179	53 27 13	3191
10	Mars	W.	116 36 52	2781	118 11 45	2789	119 46 27	2797	121 20 59	2805
	Saturn	W.	98 56 37	2841	100 30 11	2850	102 3 34	2858	103 36 46	2866
	α Arietis	W.	83 58 29	2971	85 29 17	2979	86 59 56	2988	88 30 24	2996
	Aldebaran	W.	53 9 52	2887	54 42 27	2895	56 14 52	2902	58 47 8	2910
	Sun	E.	46 17 51	3248	44 52 39	3259	43 27 40	3270	42 2 54	3281
11	Saturn	W.	111 20 16	2905	112 52 29	2912	114 24 33	2918	115 56 28	2924
	α Arietis	W.	96 0 15	3036	97 29 43	3044	98 59 2	3052	100 28 11	3059
	Aldebaran	W.	65 26 5	2946	66 57 26	2952	68 28 39	2958	69 59 44	2965
	Sun	E.	35 2 15	3337	33 38 46	3349	32 15 31	3361	30 52 29	3373
16	Sun	W.	20 47 12	3578	22 6 10	3565	23 25 23	3554	24 44 48	3544
	α Aquilæ	E.	102 44 50	3891	101 31 21	3882	100 17 43	3874	99 3 57	3868
17	Sun	W.	31 24 12	3509	32 44 27	3503	34 4 48	3497	35 25 16	3491
	α Aquilæ	E.	92 53 43	3845	91 39 27	3843	90 25 9	3841	89 10 49	3840
18	Sun	W.	42 9 8	3463	43 30 13	3457	44 51 25	3451	46 12 43	3445
	α Aquilæ	E.	82 58 59	3841	81 44 39	3843	80 30 21	3846	79 16 6	3850
	Fomalhaut	E.	114 49 58	3265	113 25 6	3257	112 0 4	3248	110 34 52	3240
19	Sun	W.	53 1 11	3408	54 23 18	3401	55 45 33	3393	57 7 57	3385
	Spica	W.	26 35 57	3120	28 3 42	3105	29 31 46	3089	31 0 9	3074
	α Aquilæ	E.	73 6 0	3878	71 52 18	3887	70 38 46	3897	69 25 23	3908
	Fomalhaut	E.	103 26 21	3197	102 0 9	3188	100 33 46	3179	99 7 12	3171
20	Sun	W.	64 2 40	3335	65 26 11	3324	66 49 54	3313	68 13 50	3301
	Spica	W.	38 26 26	3006	39 56 31	2993	41 26 52	2980	42 57 30	2967
	α Aquilæ	E.	63 21 36	3982	62 9 38	4003	60 58 1	4025	59 46 46	4049
	Fomalhaut	E.	91 51 42	3124	90 24 2	3115	88 56 11	3105	87 28 8	3095
	Mars	E.	120 53 17	2849	119 19 53	2840	117 46 17	2830	116 12 28	2819
21	Sun	W.	75 17 5	3237	76 42 30	3224	78 8 11	3209	79 34 9	3194
	Spica	W.	50 34 47	2900	52 7 6	2886	53 39 43	2871	55 12 39	2856
	Fomalhaut	E.	80 4 45	3043	78 35 26	3033	77 5 54	3022	75 36 8	3011
	Mars	E.	108 19 54	2763	106 44 38	2750	105 9 5	2738	103 33 16	2725
	Saturn	E.	128 14 58	2840	126 41 22	2828	125 7 30	2815	123 33 21	2801
22	Sun	W.	86 48 32	3116	88 16 22	3099	89 44 33	3082	91 13 5	3065
	Spica	W.	63 2 9	2779	64 37 4	2763	66 12 20	2747	67 47 57	2730
	Fomalhaut	E.	68 3 59	2958	66 32 53	2948	65 1 34	2938	63 30 3	2927
	Mars	E.	95 29 39	2654	93 51 58	2639	92 13 56	2624	90 35 33	2609

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XV^h	P. L. of Diff.	XVIII^h	P. L. of Diff.	XXI^h	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
8	α Arietis	W.	65 34 57	2870	67 7 54	2879	68 40 40	2887	70 13 15	2895
	Aldebaran	W.	34 25 26	2792	36 0 5	2799	37 34 33	2807	39 8 52	2815
	Sun	E.	63 38 23	3104	62 10 19	3117	60 42 30	3130	59 14 57	3143
9	Mars	W.	110 15 26	2746	111 51 5	2755	113 26 32	2763	115 1 48	2772
	Saturn	W.	92 40 22	2805	94 14 44	2814	95 48 54	2823	97 22 51	2832
	α Arietis	W.	77 53 30	2939	79 25 0	2946	80 56 20	2954	82 27 30	2963
	Aldebaran	W.	46 57 50	2855	48 31 6	2863	50 4 11	2871	51 37 7	2879
	Sun	E.	52 0 53	3203	50 34 47	3214	49 8 55	3225	47 43 16	3237
10	Mars	W.	122 55 21	2812	124 29 33	2819	126 3 36	2826	127 37 30	2834
	Saturn	W.	105 9 48	2874	106 42 39	2882	108 15 21	2890	109 47 53	2897
	α Arietis	W.	90 0 42	3004	91 30 50	3012	93 0 48	3020	94 30 36	3028
	Aldebaran	W.	59 19 14	2918	60 51 10	2925	62 22 57	2932	63 54 35	2939
	Sun	E.	40 38 20	3292	39 13 59	3303	37 49 52	3314	36 25 57	3325
11	Saturn	W.	117 28 16	2931	118 59 55	2938	120 31 26	2944	122 2 49	2950
	α Arietis	W.	101 57 11	3067	103 26 1	3074	104 54 42	3082	106 23 13	3090
	Aldebaran	W.	71 30 41	2971	73 1 30	2977	74 32 11	2983	76 2 45	2989
	Sun	E.	29 29 42	3386	28 7 10	3400	26 44 53	3414	25 22 52	3429
16	Sun	W.	26 4 24	3535	27 24 9	3527	28 44 3	3521	30 4 4	3515
	α Aquilæ	E.	97 50 5	3862	96 36 7	3857	95 22 4	3853	94 7 56	3849
17	Sun	W.	36 45 50	3486	38 6 30	3480	39 27 16	3474	40 48 9	3469
	α Aquilæ	E.	87 56 27	3839	86 42 5	3838	85 27 42	3839	84 13 20	3840
18	Sun	W.	47 34 9	3438	48 55 42	3431	50 17 23	3423	51 39 13	3415
	α Aquilæ	E.	78 1 55	3854	76 47 48	3859	75 33 46	3864	74 19 50	3870
	Fomalhaut	E.	109 9 30	3231	107 43 58	3223	106 18 16	3214	104 52 24	3205
19	Sun	W.	58 30 32	3375	59 53 17	3365	61 16 13	3355	62 39 21	3345
	Spica	W.	32 28 51	3060	33 57 50	3047	35 27 5	3033	36 56 37	3019
	α Aquilæ	E.	68 12 11	3919	66 59 11	3932	65 46 24	3947	64 33 52	3963
	Fomalhaut	E.	97 40 28	3162	96 13 33	3153	94 46 28	3143	93 19 11	3133
20	Sun	W.	69 38 0	3289	71 2 24	3277	72 27 2	3264	73 51 56	3251
	Spica	W.	44 28 24	2954	45 59 34	2941	47 31 1	2927	49 2 45	2913
	α Aquilæ	E.	58 35 55	4076	57 25 30	4107	56 15 35	4140	55 6 12	4176
	Fomalhaut	E.	85 59 52	3085	84 31 24	3075	83 2 44	3065	81 33 51	3054
	Mars	E.	114 38 25	2809	113 4 9	2798	111 29 39	2787	109 54 54	2775
21	Sun	W.	81 0 25	3179	82 26 58	3164	83 53 50	3148	85 21 1	3132
	Spica	W.	56 45 54	2842	58 19 28	2827	59 53 21	2811	61 27 35	2795
	Fomalhaut	E.	74 6 9	3000	72 35 56	2990	71 5 31	2979	69 34 52	2968
	Mars	E.	101 57 9	2712	100 20 45	2698	98 44 2	2684	97 7 0	2669
	Saturn	E.	121 58 55	2787	120 24 11	2773	118 49 8	2759	117 13 46	2744
22	Sun	W.	92 41 58	3047	94 11 13	3029	95 40 50	3011	97 10 49	2992
	Spica	W.	69 23 57	2713	71 0 19	2696	72 37 4	2679	74 14 12	2662
	Fomalhaut	E.	61 58 19	2917	60 26 22	2908	58 54 13	2900	57 21 54	2892
	Mars	E.	88 56 50	2593	87 17 45	2576	85 38 17	2559	83 58 26	2543

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh	P. L. of Diff.	VIh	P. L. of Diff.	IXh	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
22	SATURN	E.	115 38 5	2729	114 2 4	2713	112 25 42	2698	110 48 59	2682
23	SUN	W.	98 41 11	2973	100 11 57	2954	101 43 7	2935	103 14 41	2916
	Spica	W.	75 51 43	2644	77 29 38	2626	79 7 58	2608	80 46 42	2590
	Antares	W.	30 1 27	2677	31 38 38	2654	33 16 20	2632	34 54 32	2610
	Fomalhaut	E.	55 49 25	2885	54 16 46	2878	52 43 59	2873	51 11 5	2869
	MARS	E.	82 18 13	2526	80 37 36	2508	78 56 34	2491	77 15 8	2474
	SATURN	E.	102 39 56	2598	101 0 58	2580	99 21 36	2562	97 41 49	2545
	a Arietis	E.	117 53 11	2758	116 17 48	2737	114 41 56	2716	113 5 37	2695
24	SUN	W.	110 58 42	2818	112 32 46	2798	114 7 17	2778	115 42 13	2758
	Spica	W.	89 6 43	2497	90 48 1	2478	92 29 45	2460	94 11 55	2441
	Antares	W.	43 12 50	2504	44 53 57	2484	46 35 32	2464	48 17 36	2444
	MARS	E.	68 41 44	2384	66 57 46	2365	65 13 21	2347	63 28 30	2328
	SATURN	E.	89 16 38	2453	87 34 18	2434	85 51 32	2415	84 8 19	2396
	a Arietis	E.	104 56 57	2590	103 17 49	2570	101 38 12	2550	99 58 8	2530
25	SUN	W.	123 43 27	2661	125 21 0	2642	126 58 58	2624	128 37 21	2605
	Spica	W.	102 49 25	2348	104 34 14	2330	106 19 30	2313	108 5 11	2295
	Antares	W.	56 55 1	2345	58 39 55	2326	60 25 16	2307	62 11 5	2288
	MARS	E.	54 37 33	2238	52 50 1	2220	51 2 3	2202	49 13 38	2184
	SATURN	E.	75 25 30	2303	73 39 35	2285	71 53 14	2267	70 6 26	2249
	a Arietis	E.	91 30 54	2433	89 48 7	2415	88 4 53	2397	86 21 14	2379
	Aldebaran	E.	122 11 46	2350	120 27 0	2331	118 41 46	2313	116 56 5	2294
26	Antares	W.	71 6 55	2200	72 55 23	2183	74 44 16	2167	76 33 33	2151
	MARS	E.	40 5 2	2100	38 14 3	2084	36 22 39	2069	34 30 52	2054
	SATURN	E.	61 5 52	2163	59 16 28	2147	57 26 40	2131	55 36 28	2116
	a Arietis	E.	77 36 49	2298	75 50 46	2284	74 4 22	2271	72 17 38	2258
	Aldebaran	E.	108 0 51	2204	106 12 30	2188	104 23 44	2172	102 34 33	2156
27	Antares	W.	85 45 41	2081	87 37 10	2069	89 28 58	2057	91 21 4	2046
	a Aquilæ	W.	47 27 30	3752	48 43 22	3647	50 1 6	3548	51 20 37	3457
	MARS	E.	25 6 19	1986	23 12 22	1974	21 18 6	1963	19 23 32	1952
	SATURN	E.	46 19 51	2046	44 27 29	2034	42 34 48	2023	40 41 49	2012
	a Arietis	E.	63 19 35	2204	61 31 14	2197	59 42 42	2191	57 54 1	2186
	Aldebaran	E.	93 22 59	2085	91 31 37	2073	89 39 56	2061	87 47 56	2050
28	Antares	W.	100 45 31	2001	102 39 4	1994	104 32 48	1988	106 26 41	1983
	a Aquilæ	W.	58 20 45	3119	59 48 31	3069	61 17 18	3024	62 47 1	2984
	SATURN	E.	31 12 58	1968	29 18 33	1961	27 23 57	1955	25 29 12	1951
	a Arietis	E.	48 49 31	2186	47 0 42	2192	45 12 2	2200	43 23 34	2211
	Aldebaran	E.	78 24 7	2006	76 30 42	1999	74 37 6	1993	72 43 21	1989
29	*a* Aquilæ	W.	70 26 45	2836	72 0 26	2817	73 34 32	2801	75 8 59	2787
	Aldebaran	E.	63 13 12	1977	61 19 2	1978	59 24 53	1979	57 30 46	1982
	Pollux	E.	107 18 21	1961	105 23 45	1960	103 29 8	1960	101 34 31	1962
30	*a* Aquilæ	W.	83 4 38	2757	84 40 3	2758	86 15 26	2761	87 50 45	2767
	MARS	W.	21 18 40	1898	23 14 57	1904	25 11 4	1911	27 7 0	1918
	Aldebaran	E.	48 1 38	2008	46 8 16	2016	44 15 7	2026	42 22 13	2037
	Pollux	E.	92 2 20	1979	90 8 13	1985	88 14 15	1992	86 20 28	1999

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XV^{h}	P. L. of Diff.	$\mathrm{XVIII}^{\mathrm{h}}$	P. L. of Diff.	$\mathrm{XXI}^{\mathrm{h}}$	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
22	SATURN	E.	109 11 55	2666	107 34 29	2649	105 56 41	2632	104 18 30	2615
23	SUN	W.	104 46 39	2897	106 19 2	2877	107 51 50	2858	109 25 3	2838
	Spica	W.	82 25 51	2572	84 5 25	2553	85 45 25	2534	87 25 51	2515
	Antares	W.	36 33 13	2589	38 12 24	2568	39 52 3	2546	41 32 12	2525
	Fomalhaut	E.	49 38 6	2866	48 5 3	2865	46 31 59	2866	44 58 56	2867
	MARS	E.	75 33 18	2456	73 51 3	2438	72 8 22	2420	70 25 16	2402
	SATURN	E.	96 1 38	2527	94 21 2	2508	92 40 0	2489	90 58 32	2471
	α Arietis	E.	111 28 50	2673	109 51 34	2652	108 13 50	2631	106 35 38	2610
24	SUN	W.	117 17 36	2738	118 53 25	2719	120 29 40	2700	122 6 20	2680
	Spica	W.	95 54 32	2422	97 37 36	2403	99 21 6	2385	101 5 2	2366
	Antares	W.	50 0 8	2424	51 43 9	2404	53 26 38	2384	55 10 36	2365
	MARS	E.	61 43 12	2310	59 57 27	2292	58 11 16	2274	56 24 38	2256
	SATURN	E.	82 24 39	2378	80 40 32	2359	78 55 58	2340	77 10 57	2322
	α Arietis	E.	98 17 36	2510	96 36 36	2490	94 55 9	2471	93 13 15	2452
25	SUN	W.	130 16 9	2587	131 55 22	2569	133 34 59	2552	135 15 0	2535
	Spica	W.	109 51 18	2278	111 37 50	2261	113 24 46	2244	115 12 8	2227
	Antares	W.	63 57 22	2270	65 44 6	2252	67 31 16	2234	69 18 53	2217
	MARS	E.	47 24 46	2167	45 35 28	2150	43 45 45	2133	41 55 36	2116
	SATURN	E.	68 19 11	2231	66 31 30	2214	64 43 23	2197	62 54 51	2180
	α Arietis	E.	84 37 9	2362	82 52 40	2345	81 7 46	2329	79 22 29	2313
	Aldebaran	E.	115 9 56	2275	113 23 19	2257	111 36 16	2239	109 48 47	2221
26	Antares	W.	78 23 14	2136	80 13 18	2122	82 3 44	2108	83 54 32	2094
	MARS	E.	32 38 41	2039	30 46 8	2025	28 53 13	2011	26 59 56	1998
	SATURN	E.	53 45 53	2101	51 54 55	2086	50 3 35	2072	48 11 53	2059
	α Arietis	E.	70 30 36	2245	68 43 15	2233	66 55 37	2223	65 7 43	2213
	Aldebaran	E.	100 44 59	2141	98 55 2	2126	97 4 42	2112	95 14 1	2098
27	Antares	W.	93 13 27	2035	95 6 6	2025	96 59 1	2016	98 52 10	2009
	α Aquilæ	W.	52 41 49	3377	54 4 32	3304	55 28 39	3236	56 54 5	3174
	MARS	E.	17 28 42	1942	15 33 36	1933	13 38 14	1924	11 42 39	1916
	SATURN	E.	38 48 33	2002	36 55 0	1992	35 1 13	1983	33 7 12	1975
	α Arietis	E.	56 5 13	2182	54 16 19	2181	52 27 23	2180	50 38 26	2182
	Aldebaran	E.	85 55 40	2040	84 3 8	2030	82 10 21	2022	80 17 20	2014
28	Antares	W.	108 20 42	1979	110 14 50	1976	112 9 2	1974	114 3 17	1972
	α Aquilæ	W.	64 17 34	2947	65 48 53	2914	67 20 54	2884	68 53 33	2858
	SATURN	E.	23 34 20	1947	21 39 22	1944	19 44 20	1942	17 49 14	1941
	α Arietis	E.	41 35 23	2226	39 47 34	2244	38 0 12	2266	36 13 23	2292
	Aldebaran	E.	70 49 29	1985	68 55 31	1982	67 1 28	1980	65 7 21	1978
29	α Aquilæ	W.	76 43 45	2776	78 18 45	2767	79 53 56	2761	81 29 15	2758
	Aldebaran	E.	55 36 43	1985	53 42 45	1989	51 48 54	1994	49 55 11	2001
	Pollux	E.	99 39 56	1964	97 45 24	1967	95 50 57	1970	93 56 35	1974
30	α Aquilæ	W.	89 25 56	2775	91 0 57	2784	92 35 46	2795	94 10 20	2810
	MARS	W.	29 2 45	1926	30 58 16	1935	32 53 33	1945	34 48 35	1955
	Aldebaran	E.	40 29 36	2048	38 37 17	2061	36 45 18	2075	34 53 41	2091
	Pollux	E.	84 26 52	2007	82 33 29	2016	80 40 21	2026	78 47 28	2036

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S					Sidereal Time of Semi-diameter Passing Meridian.	Equation of Time, to be Subtracted from Apparent Time.	Diff. for 1 Hour.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Semi-diameter.			
		h m s	s	° ′ ″	″	′ ″	s	m s	s
Frid.	1	12 28 6.04	9.047	S. 3 2 14.2	−58.26	16 0.78	64.31	10 10.78	0.807
Sat.	2	12 31 43.31	9.060	3 25 31.5	58.17	16 1.05	64.36	10 29.99	0.794
SUN.	3	12 35 20.91	9.073	3 48 46.5	58.08	16 1.32	64.40	10 48.88	0.781
Mon.	4	12 38 58.85	9.088	4 11 59.0	−57.96	16 1.59	64.44	11 7.44	0.766
Tues.	5	12 42 37.14	9.103	4 35 8.7	57.84	16 1.86	64.49	11 25.65	0.751
Wed.	6	12 46 15.81	9.119	4 58 15.2	57.70	16 2.13	64.54	11 43.49	0.735
Thur.	7	12 49 54.87	9.136	5 21 18.0	−57.55	16 2.41	64.60	12 0.94	0.718
Frid.	8	12 53 34.36	9.154	5 44 16.9	57.38	16 2.68	64.66	12 17.96	0.700
Sat.	9	12 57 14.29	9.172	6 7 11.5	57.19	16 2.95	64.72	12 34.54	0.681
SUN.	10	13 0 54.67	9.192	6 30 1.4	−56.98	16 3.22	64.79	12 50.67	0.661
Mon.	11	13 4 35.52	9.212	6 52 46.2	56.75	16 3.49	64.86	13 6.33	0.642
Tues.	12	13 8 16.86	9.233	7 15 25.6	56.52	16 3.76	64.93	13 21.50	0.622
Wed.	13	13 11 58.70	9.254	7 37 59.1	−56.27	16 4.04	65.01	13 36.17	0.600
Thur.	14	13 15 41.07	9.276	8 0 26.3	56.00	16 4.31	65.09	13 50.32	0.578
Frid.	15	13 19 23.97	9.299	8 22 46.8	55.72	16 4.58	65.17	14 3.93	0.556
Sat.	16	13 23 7.42	9.322	8 45 0.3	−55.41	16 4.86	65.25	14 16.99	0.533
SUN.	17	13 26 51.44	9.346	9 7 6.3	55.08	16 5.14	65.33	14 29.49	0.509
Mon.	18	13 30 36.04	9.371	9 29 4.4	54.75	16 5.41	65.42	14 41.42	0.484
Tues.	19	13 34 21.23	9.396	9 50 54.2	−54.40	16 5.69	65.51	14 52.75	0.459
Wed.	20	13 38 7.03	9.422	10 12 35.3	54.02	16 5.97	65.60	15 3.48	0.434
Thur.	21	13 41 53.45	9.448	10 34 7.3	53.64	16 6.24	65.69	15 13.58	0.408
Frid.	22	13 45 40.52	9.475	10 55 29.8	−53.23	16 6.52	65.79	15 23.04	0.380
Sat.	23	13 49 28.24	9.502	11 16 42.4	52.81	16 6.79	65.89	15 31.85	0.353
SUN.	24	13 53 16.62	9.530	11 37 44.7	52.37	16 7.06	65.99	15 40.01	0.325
Mon.	25	13 57 5.68	9.559	11 58 36.3	−51.92	16 7.33	66.09	15 47.48	0.296
Tues.	26	14 0 55.45	9.588	12 19 16.8	51.45	16 7.60	66.20	15 54.25	0.267
Wed.	27	14 4 45.93	9.618	12 39 45.8	50.97	16 7.86	66.30	16 0.30	0.237
Thur.	28	14 8 37.14	9.650	13 0 3.0	−50.46	16 8.12	66.41	16 5.63	0.206
Frid.	29	14 12 29.11	9.682	13 20 8.0	49.94	16 8.38	66.52	16 10.20	0.174
Sat.	30	14 16 21.85	9.714	13 40 0.5	49.41	16 8.64	66.63	16 14.00	0.142
SUN.	31	14 20 15.37	9.747	13 59 40.0	48.87	16 8.89	66.74	16 17.03	0.110
Mon.	32	14 24 9.69	9.780	S. 14 19 6.1	−48.31	16 9.13	66.86	16 19.26	0.076

NOTE.—The mean time of semidiameter passing the meridian may be found by subtracting $0^s.19$ from the sidereal time. The sign − prefixed to the hourly change of declination indicates that south declinations are increasing.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S				Equation of Time, to be Added to Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.			
		h m s	s	° ′ ″	″	m s	s	h m s
Frid.	1	12 28 7.57	9.049	S. 3 2 24.1	−58.27	10 10.89	0.807	12 38 18.46
Sat.	2	12 31 44.90	9.062	3 25 41.7	58.19	10 30.12	0.794	12 42 15.02
SUN.	3	12 35 22.56	9.075	3 48 57.0	58.09	10 49.02	0.781	12 46 11.57
Mon.	4	12 39 0.55	9.090	4 12 9.7	−57.97	11 7.59	0.766	12 50 8.12
Tues.	5	12 42 38.87	9.105	4 35 19.8	57.84	11 25.80	0.751	12 54 4.67
Wed.	6	12 46 17.54	9.122	4 58 26.4	57.70	11 43.64	0.735	12 58 1.23
Thur.	7	12 49 56.69	9.138	5 21 29.5	−57.54	12 1.08	0.718	13 1 57.78
Frid.	8	12 53 36.24	9.156	5 44 28.7	57.37	12 18.10	0.700	13 5 54.34
Sat.	9	12 57 16.21	9.174	6 7 23.5	57.19	12 34.68	0.681	13 9 50.89
SUN.	10	13 0 56.63	9.194	6 30 13.6	−56.99	12 50.81	0.661	13 13 47.44
Mon.	11	13 4 37.53	9.214	6 52 58.6	56.77	13 6.46	0.642	13 17 43.99
Tues.	12	13 8 18.92	9.235	7 15 38.2	56.52	13 21.63	0.622	13 21 40.55
Wed.	13	13 12 0.80	9.256	7 38 11.9	−56.27	13 36.30	0.600	13 25 37.10
Thur.	14	13 15 43.21	9.278	8 0 39.2	56.00	13 50.45	0.578	13 29 33.66
Frid.	15	13 19 26.15	9.301	8 22 59.9	55.71	14 4.06	0.556	13 33 30.21
Sat.	16	13 23 9.64	9.324	8 45 13.5	−55.41	14 17.12	0.533	13 37 26.76
SUN.	17	13 26 53.70	9.348	9 7 19.6	55.09	14 29.62	0.509	13 41 23.32
Mon.	18	13 30 38.33	9.372	9 29 17.8	54.75	14 41.54	0.484	13 45 19.87
Tues.	19	13 34 23.56	9.397	9 51 7.7	−54.39	14 52.86	0.459	13 49 16.42
Wed.	20	13 38 9.40	9.423	10 12 48.9	54.02	15 3.58	0.434	13 53 12.98
Thur.	21	13 41 55.85	9.449	10 34 21.0	53.63	15 13.68	0.408	13 57 9.53
Frid.	22	13 45 42.95	9.476	10 55 43.5	−53.23	15 23.14	0.380	14 1 6.09
Sat.	23	13 49 30.70	9.503	11 16 56.1	52.81	15 31.94	0.353	14 5 2.64
SUN.	24	13 53 19.11	9.531	11 37 58.4	52.37	15 40.09	0.325	14 8 59.20
Mon.	25	13 57 8.20	9.560	11 58 50.0	−51.91	15 47.55	0.296	14 12 55.75
Tues.	26	14 0 58.00	9.590	12 19 30.5	51.44	15 54.31	0.267	14 16 52.31
Wed.	27	14 4 48.50	9.620	12 39 59.4	50.95	16 0.36	0.237	14 20 48.86
Thur.	28	14 8 39.73	9.651	13 0 16.5	−50.46	16 5.68	0.206	14 24 45.41
Frid.	29	14 12 31.72	9.683	13 20 21.5	49.96	16 10.25	0.174	14 28 41.97
Sat.	30	14 16 24.48	9.715	13 40 13.9	49.43	16 14.04	0.142	14 32 38.52
SUN.	31	14 20 18.03	9.747	13 59 53.3	48.87	16 17.05	0.110	14 36 35.08
Mon.	32	14 24 12.36	9.781	S. 14 19 19.2	−48.29	16 19.28	0.076	14 40 31.63

Note.—The semidiameter for mean noon may be assumed the same as that for apparent noon.
The sign − prefixed to the hourly change of declination indicates that south declinations are increasing.

Diff. for 1 Hour,
$+ 9^s.8565$.
(Table III.)

AT GREENWICH MEAN NOON.

Day of the Month.	Day of the Year.	THE SUN'S				Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.
		TRUE LONGITUDE.		Diff. for 1 Hour.	LATITUDE.			
		λ	λ′					
		° ′ ″	′ ″	″	″			h m s
1	274	187 39 47.7	39 26.7	147.54	− 0.33	0.000 3274	− 51.5	11 19 49.86
2	275	188 38 49.8	38 28.6	147.64	0.21	0.000 2042	51.3	11 15 53.96
3	276	189 37 54.1	37 32.9	147.73	− 0.08	0.000 0814	51.1	11 11 58.05
4	277	190 37 0.7	36 39.4	147.83	+ 0.05	9.999 9588	− 51.0	11 8 2.14
5	278	191 36 9.7	35 48.2	147.92	0.18	9.999 8365	51.0	11 4 6.23
6	279	192 35 21.0	34 59.4	148.02	0.28	9.999 7142	50.9	11 0 10.33
7	280	193 34 34.6	34 13.0	148.12	+ 0.38	9.999 5919	− 51.0	10 56 14.42
8	281	194 33 50.6	33 28.8	148.22	0.46	9.999 4695	51.0	10 52 18.51
9	282	195 33 8.8	32 47.0	148.31	0.49	9.999 3470	51.1	10 48 22.60
10	283	196 32 29.3	32 7.4	148.40	+ 0.52	9.999 2243	− 51.2	10 44 26.70
11	284	197 31 52.1	31 30.0	148.49	0.50	9.999 1013	51.3	10 40 30.79
12	285	198 31 17.0	30 54.8	148.58	0.48	9.998 9780	51.4	10 36 34.88
13	286	199 30 44.0	30 21.8	148.67	+ 0.42	9.998 8545	− 51.5	10 32 38.97
14	287	200 30 13.2	29 50.8	148.76	0.32	9.998 7307	51.6	10 28 43.06
15	288	201 29 44.3	29 21.8	148.84	0.22	9.998 6067	51.7	10 24 47.16
16	289	202 29 17.5	28 54.8	148.92	+ 0.10	9.998 4825	− 51.8	10 20 51.25
17	290	203 28 52.5	28 29.8	149.00	− 0.03	9.998 3582	51.8	10 16 55.34
18	291	204 28 29.5	28 6.6	149.08	0.16	9.998 2339	51.8	10 12 59.43
19	292	205 28 8.2	27 45.2	149.15	− 0.30	9.998 1097	− 51.7	10 9 3.52
20	293	206 27 48.8	27 25.7	149.23	0.42	9.997 9856	51.6	10 5 7.62
21	294	207 27 31.0	27 7.8	149.30	0.53	9.997 8619	51.4	10 1 11.71
22	295	208 27 15.0	26 51.7	149.37	− 0.62	9.997 7386	− 51.2	9 57 15.80
23	296	209 27 0.6	26 37.2	149.44	0.69	9.997 6160	50.8	9 53 19.89
24	297	210 26 48.0	26 24.4	149.51	0.72	9.997 4942	50.4	9 49 23.98
25	298	211 26 37.0	26 13.3	149.58	− 0.72	9.997 3734	− 50.0	9 45 28.07
26	299	212 26 27.6	26 3.8	149.65	0.69	9.997 2538	49.6	9 41 32.16
27	300	213 26 20.1	25 56.2	149.72	0.64	9.997 1355	49.0	9 37 36.26
28	301	214 26 14.4	25 50.4	149.79	− 0.54	9.997 0187	− 48.4	9 33 40.35
29	302	215 26 10.6	25 46.4	149.87	0.44	9.996 9033	47.8	9 29 44.44
30	303	216 26 8.7	25 44.4	149.96	0.30	9.996 7896	47.1	9 25 48.53
31	304	217 26 8.8	25 44.4	150.05	0.18	9.996 6774	46.5	9 21 52.62
32	305	218 26 11.0	25 46.4	150.13	− 0.04	9.996 5666	− 45.9	9 17 56.71

Note.—The numbers in column λ correspond to the true equinox of the date; in column λ′ to the mean equinox of January $0^d.0$.

Diff. for 1 Hour, — $9^s.8296$. (Table II.)

GREENWICH MEAN TIME.

THE MOON'S

Day of the Month.	SEMIDIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
	′ ″	′ ″	′ ″	″	′ ″	″	h m	m	d
1	16 37.6	16 32.4	60 55.5	− 1.41	60 36.5	− 1.72	14 9.3	2.29	16.9
2	16 26.4	16 19.7	60 14.3	1.96	59 49.4	2.15	15 4.9	2.35	17.9
3	16 12.4	16 4.8	59 22.7	2.28	58 54.7	2.35	16 1.8	2.39	18.9
4	15 57.0	15 49.3	58 26.3	− 2.37	57 57.9	− 2.34	16 59.3	2.39	19.9
5	15 41.8	15 34.5	57 30.2	2.28	57 3.4	2.17	17 56.0	2.33	20.9
6	15 27.5	15 21.1	56 38.0	2.05	56 14.2	1.91	18 50.5	2.21	21.9
7	15 15.1	15 9.6	55 52.2	− 1.76	55 32.2	− 1.59	19 42.0	2.08	22.9
8	15 4.7	15 0.3	55 14.1	1.42	54 58.0	1.25	20 30.1	1.94	23.9
9	14 56.4	14 53.2	54 44.0	1.09	54 31.8	0.93	21 15.1	1.82	24.9
10	14 50.4	14 48.1	54 21.7	− 0.78	54 13.3	− 0.63	21 57.6	1.73	25.9
11	14 46.3	14 44.9	54 6.6	0.49	54 1.5	0.36	22 38.3	1.67	26.9
12	14 44.0	14 43.5	53 58.1	− 0.23	53 56.0	− 0.10	23 18.2	1.66	27.9
13	14 43.3	14 43.5	53 55.4	+ 0.01	53 56.1	+ 0.11	23 58.0	1.67	28.9
14	14 44.0	14 44.9	53 58.1	0.22	54 1.4	0.33	ó	. . .	0.2
15	14 46.2	14 47.7	54 6.0	0.44	54 11.8	0.55	0 38.8	1.73	1.2
16	14 49.6	14 52.0	54 19.0	+ 0.66	54 27.6	+ 0.78	1 21.3	1.82	2.2
17	14 54.7	14 57.8	54 37.6	0.90	54 49.1	1.02	2 6.2	1.93	3.2
18	15 1.4	15 5.4	55 2.1	1.15	55 16.7	1.28	2 54.2	2.06	4.2
19	15 9.8	15 14.7	55 32.9	+ 1.42	55 50.8	+ 1.56	3 45.1	2.19	5.2
20	15 20.0	15 25.7	56 10.3	1.69	56 31.4	1.82	4 38.8	2.28	6.2
21	15 31.9	15 38.4	56 53.9	1.94	57 17.8	2.04	5 34.3	2.33	7.2
22	15 45.2	15 52.2	57 42.8	+ 2.12	58 8.6	+ 2.17	6 30.3	2.33	8.2
23	15 59.3	16 6.4	58 34.8	2.19	59 1.0	2.16	7 25.7	2.28	9.2
24	16 13.4	16 20.1	59 26.6	2.09	59 51.0	1.96	8 19.9	2.23	10.2
25	16 26.3	16 31.8	60 13.7	+ 1.78	60 33.8	+ 1.55	9 12.8	2.19	11.2
26	16 36.4	16 40.0	60 50.8	1.26	61 4.0	0.93	10 5.1	2.18	12.2
27	16 42.4	16 43.6	61 13.0	+ 0.55	61 17.3	+ 0.15	10 57.7	2.21	13.2
28	16 43.4	16 41.9	61 16.6	− 0.26	61 11.1	− 0.66	11 51.5	2.28	14.2
29	16 39.1	16 35.0	61 0.7	1.05	60 45.8	1.41	12 47.4	2.37	15.2
30	16 29.8	16 23.7	60 26.8	1.72	60 4.4	1.98	13 45.3	2.45	16.2
31	16 16.9	16 9.5	59 39.2	2.18	59 11.9	2.32	14 44.8	2.49	17.2
32	16 1.7	15 53.7	58 43.4	− 2.40	58 14.2	− 2.43	15 44.2	2.45	18.2

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	FRIDAY 1.			
	h m s	s	° ′ ″	″
0	2 16 37.69	2.3374	N.10 41 27.1	14.954
1	2 18 57.99	2.3392	10 56 22.0	14.876
2	2 21 18.40	2.3412	11 11 12.2	14.797
3	2 23 38.93	2.3432	11 25 57.6	14.715
4	2 25 59.58	2.3452	11 40 38.0	14.632
5	2 28 20.35	2.3472	11 55 13.4	14.547
6	2 30 41.24	2.3492	12 9 43.6	14.459
7	2 33 2.26	2.3513	12 24 8.5	14.371
8	2 35 23.40	2.3534	12 38 28.1	14.282
9	2 37 44.67	2.3556	12 52 42.3	14.191
10	2 40 6.07	2.3577	13 6 51.0	14.097
11	2 42 27.59	2.3598	13 20 54.0	14.002
12	2 44 49.25	2.3621	13 34 51.2	13.905
13	2 47 11.04	2.3642	13 48 42.6	13.807
14	2 49 32.96	2.3665	14 2 28.1	13.708
15	2 51 55.02	2.3687	14 16 7.6	13.607
16	2 54 17.21	2.3710	14 29 41.0	13.505
17	2 56 39.54	2.3733	14 43 8.2	13.401
18	2 59 2.01	2.3756	14 56 29.1	13.295
19	3 1 24.62	2.3779	15 9 43.6	13.188
20	3 3 47.36	2.3802	15 22 51.7	13.080
21	3 6 10.24	2.3824	15 35 53.2	12.970
22	3 8 33.25	2.3847	15 48 48.1	12.858
23	3 10 56.41	2.3872	N.16 1 36.2	12.746
	SATURDAY 2.			
0	3 13 19.71	2.3895	N.16 14 17.6	12.632
1	3 15 43.15	2.3918	16 26 52.1	12.517
2	3 18 6.73	2.3942	16 39 19.6	12.399
3	3 20 30.45	2.3964	16 51 40.0	12.281
4	3 22 54.30	2.3988	17 3 53.3	12.162
5	3 25 18.30	2.4012	17 15 59.4	12.041
6	3 27 42.44	2.4034	17 27 58.2	11.919
7	3 30 6.71	2.4057	17 39 49.7	11.797
8	3 32 31.12	2.4079	17 51 33.8	11.672
9	3 34 55.66	2.4102	18 3 10.3	11.546
10	3 37 20.34	2.4125	18 14 39.3	11.419
11	3 39 45.16	2.4147	18 26 0.6	11.291
12	3 42 10.11	2.4169	18 37 14.2	11.162
13	3 44 35.19	2.4191	18 48 20.0	11.032
14	3 47 0.40	2.4212	18 59 18.0	10.901
15	3 49 25.74	2.4234	19 10 8.1	10.768
16	3 51 51.21	2.4255	19 20 50.2	10.634
17	3 54 16.80	2.4276	19 31 24.2	10.500
18	3 56 42.52	2.4297	19 41 50.2	10.365
19	3 59 8.36	2.4317	19 52 8.0	10.228
20	4 1 34.32	2.4337	20 2 17.6	10.091
21	4 4 0.40	2.4356	20 12 18.9	9.952
22	4 6 26.59	2.4375	20 22 11.8	9.812
23	4 8 52.90	2.4394	20 31 56.4	9.672
24	4 11 19.32	2.4412	N.20 41 32.5	9.531

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	SUNDAY 3.			
	h m s	s	° ′ ″	″
0	4 11 19.32	2.4412	N.20 41 32.5	9.531
1	4 13 45.85	2.4430	20 51 0.1	9.389
2	4 16 12.48	2.4447	21 0 19.2	9.247
3	4 18 39.22	2.4464	21 9 29.7	9.103
4	4 21 6.05	2.4480	21 18 31.6	8.959
5	4 23 32.98	2.4497	21 27 24.8	8.813
6	4 26 0.01	2.4512	21 36 9.2	8.667
7	4 28 27.12	2.4526	21 44 44.8	8.520
8	4 30 54.32	2.4541	21 53 11.6	8.373
9	4 33 21.61	2.4554	22 1 29.6	8.225
10	+ 35 48.97	2.4567	22 9 38.6	8.076
11	4 38 16.41	2.4580	22 17 38.7	7.927
12	4 40 43.93	2.4592	22 25 29.8	7.777
13	4 43 11.52	2.4603	22 33 11.9	7.626
14	4 45 39.17	2.4613	22 40 44.9	7.475
15	4 48 6.88	2.4623	22 48 8.9	7.324
16	4 50 34.65	2.4632	22 55 23.8	7.172
17	4 53 2.47	2.4641	23 2 29.5	7.018
18	4 55 30.34	2.4649	23 9 26.0	6.866
19	4 57 58.26	2.4657	23 16 13.4	6.712
20	5 0 26.22	2.4663	23 22 51.5	6.558
21	5 2 54.21	2.4667	23 29 20.4	6.404
22	5 5 22.23	2.4672	23 35 40.0	6.250
23	5 7 50.28	2.4677	N.23 41 50.4	6.095
	MONDAY 4.			
0	5 10 18.35	2.4680	N.23 47 51.4	5.939
1	5 12 46.44	2.4682	23 53 43.1	5.784
2	5 15 14.54	2.4684	23 59 25.5	5.628
3	5 17 42.65	2.4685	24 4 58.5	5.472
4	5 20 10.76	2.4684	24 10 22.1	5.315
5	5 22 38.86	2.4683	24 15 36.3	5.159
6	5 25 6.96	2.4682	24 20 41.2	5.003
7	5 27 35.05	2.4680	24 25 36.7	4.846
8	5 30 3.12	2.4677	24 30 22.8	4.689
9	5 32 31.17	2.4672	24 34 59.4	4.532
10	5 34 59.19	2.4667	24 39 26.6	4.376
11	5 37 27.18	2.4661	24 43 44.5	4.219
12	5 39 55.13	2.4654	24 47 52.9	4.062
13	5 42 23.03	2.4647	24 51 51.9	3.904
14	5 44 50.88	2.4638	24 55 41.5	3.748
15	5 47 18.68	2.4628	24 59 21.7	3.592
16	5 49 46.42	2.4617	25 2 52.4	3.434
17	5 52 14.09	2.4606	25 6 13.7	3.277
18	5 54 41.69	2.4593	25 9 25.6	3.121
19	5 57 9.21	2.4580	25 12 28.1	2.964
20	5 59 36.65	2.4566	25 15 21.3	2.807
21	6 2 4.01	2.4551	25 18 5.1	2.652
22	6 4 31.27	2.4536	25 20 39.5	2.496
23	6 6 58.44	2.4519	25 23 4.6	2.341
24	6 9 25.50	2.4501	N.25 25 20.4	2.185

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	TUESDAY 5.			
	h m s	s	° ′ ″	″
0	6 9 25.50	2.4501	N.25 25 20.4	2.185
1	6 11 52.45	2.4482	25 27 26.8	2.030
2	6 14 19.29	2.4463	25 29 24.0	1.876
3	6 16 46.01	2.4442	25 31 11.9	1.721
4	6 19 12.60	2.4421	25 32 50.5	1.567
5	6 21 39.06	2.4399	25 34 19.9	1.413
6	6 24 5.39	2.4376	25 35 40.1	1.260
7	6 26 31.57	2.4352	25 36 51.1	1.107
8	6 28 57.61	2.4327	25 37 52.9	0.954
9	6 31 23.50	2.4302	25 38 45.6	0.802
10	6 33 49.23	2.4275	25 39 29.2	0.651
11	6 36 14.80	2.4247	25 40 3.7	0.500
12	6 38 40.20	2.4219	25 40 29.2	0.349
13	6 41 5.43	2.4190	25 40 45.6	0.199
14	6 43 30.48	2.4160	25 40 53.1	+0.050
15	6 45 55.35	2.4130	25 40 51.6	−0.099
16	6 48 20.04	2.4098	25 40 41.2	0.247
17	6 50 44.53	2.4066	25 40 21.9	0.396
18	6 53 8.83	2.4033	25 39 53.7	0.543
19	6 55 32.93	2.3999	25 39 16.7	0.690
20	6 57 56.82	2.3964	25 38 30.9	0.836
21	7 0 20.50	2.3928	25 37 36.4	0.981
22	7 2 43.96	2.3893	25 36 33.2	1.125
23	7 5 7.21	2.3856	N.25 35 21.4	1.269
	WEDNESDAY 6.			
0	7 7 30.23	2.3817	N.25 34 0.9	1.412
1	7 9 53.02	2.3779	25 32 31.9	1.555
2	7 12 15.58	2.3741	25 30 54.3	1.697
3	7 14 37.91	2.3702	25 29 8.3	1.838
4	7 17 0.00	2.3661	25 27 13.8	1.978
5	7 19 21.84	2.3619	25 25 10.9	2.117
6	7 21 43.43	2.3577	25 22 59.7	2.256
7	7 24 4.77	2.3536	25 20 40.2	2.394
8	7 26 25.86	2.3493	25 18 12.4	2.532
9	7 28 46.69	2.3449	25 15 36.4	2.668
10	7 31 7.25	2.3405	25 12 52.3	2.803
11	7 33 27.55	2.3361	25 10 0.0	2.938
12	7 35 47.58	2.3316	25 6 59.7	3.072
13	7 38 7.34	2.3270	25 3 51.4	3.205
14	7 40 26.82	2.3223	25 0 35.1	3.337
15	7 42 46.02	2.3177	24 57 11.0	3.467
16	7 45 4.94	2.3130	24 53 39.0	3.598
17	7 47 23.58	2.3082	24 49 59.2	3.727
18	7 49 41.93	2.3034	24 46 11.7	3.857
19	7 51 59.99	2.2986	24 42 16.4	3.985
20	7 54 17.76	2.2937	24 38 13.5	4.111
21	7 56 35.23	2.2887	24 34 3.1	4.237
22	7 58 52.41	2.2838	24 29 45.1	4.362
23	8 1 9.29	2.2788	24 25 19.7	4.485
24	8 3 25.87	2.2738	N.24 20 46.9	4.608

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	THURSDAY 7.			
	h m s	s	° ′ ″	″
0	8 3 25.87	2.2738	N.24 20 46.9	4.608
1	8 5 42.15	2.2687	24 16 6.7	4.731
2	8 7 58.12	2.2636	24 11 19.2	4.852
3	8 10 13.78	2.2585	24 6 24.5	4.972
4	8 12 29.14	2.2534	24 1 22.6	5.091
5	8 14 44.19	2.2482	23 56 13.6	5.209
6	8 16 58.93	2.2430	23 50 57.5	5.327
7	8 19 13.35	2.2377	23 45 34.4	5.443
8	8 21 27.46	2.2326	23 40 4.3	5.558
9	8 23 41.26	2.2273	23 34 27.3	5.672
10	8 25 54.74	2.2220	23 28 43.5	5.786
11	8 28 7.90	2.2167	23 22 53.0	5.898
12	8 30 20.74	2.2113	23 16 55.8	6.010
13	8 32 33.26	2.2061	23 10 51.9	6.120
14	8 34 45.47	2.2007	23 4 41.4	6.230
15	8 36 57.35	2.1953	22 58 24.3	6.339
16	8 39 8.91	2.1900	22 52 0.7	6.447
17	8 41 20.15	2.1847	22 45 30.7	6.552
18	8 43 31.07	2.1793	22 38 54.4	6.657
19	8 45 41.67	2.1740	22 32 11.8	6.762
20	8 47 51.95	2.1686	22 25 23.0	6.865
21	8 50 1.90	2.1632	22 18 28.0	6.968
22	8 52 11.53	2.1578	22 11 26.8	7.070
23	8 54 20.84	2.1525	N.22 4 19.6	7.170
	FRIDAY 8.			
0	8 56 29.83	2.1471	N.21 57 6.4	7.270
1	8 58 38.50	2.1417	21 49 47.2	7.368
2	9 0 46.84	2.1364	21 42 22.2	7.466
3	9 2 54.86	2.1311	21 34 51.3	7.562
4	9 5 2.56	2.1257	21 27 14.7	7.657
5	9 7 9.94	2.1204	21 19 32.4	7.752
6	9 9 17.01	2.1151	21 11 44.4	7.846
7	9 11 23.76	2.1097	21 3 50.9	7.938
8	9 13 30.19	2.1045	20 55 51.8	8.031
9	9 15 36.30	2.0992	20 47 47.2	8.122
10	9 17 42.10	2.0940	20 39 37.2	8.211
11	9 19 47.58	2.0887	20 31 21.9	8.299
12	9 21 52.74	2.0835	20 23 1.3	8.387
13	9 23 57.60	2.0783	20 14 35.4	8.474
14	9 26 2.14	2.0731	20 6 4.4	8.559
15	9 28 6.37	2.0680	19 57 28.3	8.644
16	9 30 10.30	2.0629	19 48 47.1	8.728
17	9 32 13.92	2.0578	19 40 0.9	8.811
18	9 34 17.24	2.0527	19 31 9.8	8.892
19	9 36 20.25	2.0476	19 22 13.8	8.974
20	9 38 22.95	2.0426	19 13 12.9	9.054
21	9 40 25.36	2.0377	19 4 7.3	9.132
22	9 42 27.47	2.0327	18 54 57.0	9.211
23	9 44 29.28	2.0277	18 45 42.0	9.288
24	9 46 30.79	2.0227	N.18 36 22.4	9.365

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	SATURDAY 9.					MONDAY 11.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	9 46 30.79	2.0227	N.18 36 22.4	9.365	0	11 18 43.66	1.8375	N. 9 55 57.5	11.994
1	9 48 32.01	2.0179	18 26 58.2	9.440	1	11 20 33.83	1.8348	9 43 56.8	12.029
2	9 50 32.94	2.0131	18 17 29.6	9.514	2	11 22 23.84	1.8322	9 31 54.0	12.064
3	9 52 33.58	2.0082	18 7 56.5	9.587	3	11 24 13.70	1.8298	9 19 49.1	12.097
4	9 54 33.93	2.0035	17 58 19.2	9.660	4	11 26 3.41	1.8273	9 7 42.3	12.129
5	9 56 34.00	1.9988	17 48 37.2	9.732	5	11 27 52.98	1.8248	8 55 33.6	12.161
6	9 58 33.79	1.9941	17 38 51.2	9.802	6	11 29 42.40	1.8225	8 43 23.0	12.192
7	10 0 33.29	1.9894	17 29 1.0	9.872	7	11 31 31.68	1.8202	8 31 10.6	12.222
8	10 2 32.52	1.9849	17 19 6.6	9.942	8	11 33 20.83	1.8181	8 18 56.4	12.252
9	10 4 31.48	1.9803	17 9 8.0	10.010	9	11 35 9.85	1.8158	8 6 40.4	12.281
10	10 6 30.16	1.9757	16 59 5.4	10.077	10	11 36 58.73	1.8137	7 54 22.6	12.309
11	10 8 28.56	1.9712	16 48 58.8	10.143	11	11 38 47.49	1.8117	7 42 3.2	12.337
12	10 10 26.70	1.9667	16 38 48.3	10.207	12	11 40 36.13	1.8097	7 29 42.2	12.363
13	10 12 24.57	1.9623	16 28 33.9	10.272	13	11 42 24.65	1.8077	7 17 19.6	12.388
14	10 14 22.18	1.9580	16 18 15.6	10.336	14	11 44 13.05	1.8057	7 4 55.5	12.413
15	10 16 19.53	1.9537	16 7 53.5	10.398	15	11 46 1.33	1.8038	6 52 30.0	12.438
16	10 18 16.62	1.9493	15 57 27.7	10.460	16	11 47 49.51	1.8021	6 40 3.0	12.462
17	10 20 13.45	1.9450	15 46 58.3	10.521	17	11 49 37.58	1.8003	6 27 34.6	12.485
18	10 22 10.02	1.9408	15 36 25.3	10.581	18	11 51 25.55	1.7987	6 15 4.8	12.507
19	10 24 6.35	1.9367	15 25 48.7	10.640	19	11 53 13.42	1.7971	6 2 33.8	12.527
20	10 26 2.43	1.9326	15 15 8.5	10.698	20	11 55 1.20	1.7955	5 50 1.5	12.548
21	10 27 58.26	1.9285	15 4 24.9	10.756	21	11 56 48.88	1.7939	5 37 28.0	12.568
22	10 29 53.85	1.9246	14 53 37.8	10.812	22	11 58 36.47	1.7925	5 24 53.3	12.588
23	10 31 49.20	1.9206	N.14 42 47.4	10.867	23	12 0 23.98	1.7912	N. 5 12 17.5	12.607
	SUNDAY 10.					TUESDAY 12.			
0	10 33 44.32	1.9166	N.14 31 53.7	10.922	0	12 2 11.41	1.7898	N. 4 59 40.6	12.624
1	10 35 39.20	1.9127	14 20 56.7	10.977	1	12 3 58.76	1.7885	4 47 2.6	12.641
2	10 37 33.84	1.9088	14 9 56.5	11.030	2	12 5 46.03	1.7873	4 34 23.6	12.657
3	10 39 28.26	1.9051	13 58 53.1	11.082	3	12 7 33.23	1.7862	4 21 43.6	12.673
4	10 41 22.46	1.9014	13 47 46.6	11.134	4	12 9 20.37	1.7851	4 9 2.7	12.688
5	10 43 16.43	1.8977	13 36 37.0	11.185	5	12 11 7.44	1.7839	3 56 21.0	12.702
6	10 45 10.18	1.8941	13 25 24.4	11.234	6	12 12 54.44	1.7829	3 43 38.5	12.715
7	10 47 3.72	1.8905	13 14 8.9	11.283	7	12 14 41.39	1.7821	3 30 55.2	12.727
8	10 48 57.04	1.8869	13 2 50.4	11.332	8	12 16 28.29	1.7812	3 18 11.2	12.739
9	10 50 50.15	1.8834	12 51 29.1	11.379	9	12 18 15.13	1.7803	3 5 26.5	12.751
10	10 52 43.05	1.8800	12 40 5.0	11.426	10	12 20 1.93	1.7796	2 52 41.1	12.762
11	10 54 35.75	1.8767	12 28 38.1	11.472	11	12 21 48.68	1.7788	2 39 55.0	12.773
12	10 56 28.25	1.8733	12 17 8.4	11.517	12	12 23 35.39	1.7782	2 27 8.3	12.782
13	10 58 20.55	1.8700	12 5 36.0	11.561	13	12 25 22.07	1.7777	2 14 21.1	12.790
14	11 0 12.65	1.8667	11 54 1.0	11.604	14	12 27 8.71	1.7771	2 1 33.4	12.797
15	11 2 4.56	1.8636	11 42 23.4	11.647	15	12 28 55.32	1.7766	1 48 45.3	12.805
16	11 3 56.28	1.8605	11 30 43.3	11.688	16	12 30 41.90	1.7762	1 35 56.8	12.812
17	11 5 47.82	1.8575	11 19 0.8	11.729	17	12 32 28.46	1.7758	1 23 7.9	12.817
18	11 7 39.18	1.8544	11 7 15.9	11.769	18	12 34 15.00	1.7755	1 10 18.7	12.822
19	11 9 30.35	1.8514	10 55 28.6	11.809	19	12 36 1.52	1.7752	0 57 29.2	12.827
20	11 11 21.35	1.8486	10 43 38.9	11.848	20	12 37 48.03	1.7751	0 44 39.5	12.830
21	11 13 12.18	1.8457	10 31 46.9	11.886	21	12 39 34.53	1.7749	0 31 49.6	12.832
22	11 15 2.84	1.8429	10 19 52.6	11.922	22	12 41 21.02	1.7749	0 18 59.6	12.835
23	11 16 53.33	1.8402	10 7 56.1	11.959	23	12 43 7.52	1.7749	N. 0 6 9.4	12.837
24	11 18 43.66	1.8375	N. 9 55 57.5	11.994	24	12 44 54.01	1.7749	S. 0 6 40.8	12.837

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	WEDNESDAY 13.					FRIDAY 15.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	12 44 54.01	1.7749	S. 0 6 40.8	12.837	0	14 11 13.30	1.8431	S. 10 9 51.1	12.009
1	12 46 40.51	1.7750	0 19 31.0	12.837	1	14 13 3.97	1.8459	10 21 50.6	11.973
2	12 48 27.01	1.7752	0 32 21.2	12.836	2	14 14 54.81	1.8487	10 33 47.9	11.936
3	12 50 13.53	1.7754	0 45 11.3	12.834	3	14 16 45.81	1.8515	10 45 42.9	11.898
4	12 52 0.06	1.7757	0 58 1.3	12.832	4	14 18 36.99	1.8544	10 57 35.7	11.860
5	12 53 46.61	1.7760	1 10 51.2	12.830	5	14 20 28.35	1.8574	11 9 26.1	11.821
6	12 55 33.18	1.7764	1 23 40.9	12.826	6	14 22 19.88	1.8604	11 21 14.2	11.782
7	12 57 19.78	1.7768	1 36 30.3	12.822	7	14 24 11.59	1.8634	11 32 59.9	11.741
8	12 59 6.40	1.7773	1 49 19.5	12.817	8	14 26 3.49	1.8666	11 44 43.1	11.698
9	13 0 53.06	1.7779	2 2 8.3	12.811	9	14 27 55.58	1.8698	11 56 23.7	11.656
10	13 2 39.75	1.7785	2 14 56.8	12.805	10	14 29 47.86	1.8730	12 8 1.8	11.613
11	13 4 26.48	1.7792	2 27 44.9	12.797	11	14 31 40.33	1.8762	12 19 37.3	11.569
12	13 6 13.25	1.7799	2 40 32.5	12.789	12	14 33 32.99	1.8794	12 31 10.1	11.524
13	13 8 0.07	1.7807	2 53 19.6	12.781	13	14 35 25.85	1.8827	12 42 40.2	11.478
14	13 9 46.93	1.7815	3 6 6.2	12.772	14	14 37 18.92	1.8862	12 54 7.5	11.432
15	13 11 33.85	1.7825	3 18 52.2	12.761	15	14 39 12.19	1.8896	13 5 32.0	11.384
16	13 13 20.83	1.7834	3 31 37.5	12.750	16	14 41 5.67	1.8931	13 16 53.6	11.336
17	13 15 7.86	1.7844	3 44 22.2	12.739	17	14 42 59.36	1.8967	13 28 12.3	11.287
18	13 16 54.96	1.7855	3 57 6.2	12.727	18	14 44 53.27	1.9002	13 39 28.0	11.237
19	13 18 42.12	1.7866	4 9 49.4	12.713	19	14 46 47.39	1.9037	13 50 40.7	11.186
20	13 20 29.35	1.7877	4 22 31.8	12.700	20	14 48 41.72	1.9074	14 1 50.3	11.134
21	13 22 16.65	1.7890	4 35 13.4	12.685	21	14 50 36.28	1.9112	14 12 56.8	11.082
22	13 24 4.03	1.7903	4 47 54.0	12.669	22	14 52 31.07	1.9150	14 24 0.1	11.028
23	13 25 51.49	1.7917	S. 5 0 33.7	12.654	23	14 54 26.08	1.9187	S. 14 35 0.2	10.974
	THURSDAY 14.					SATURDAY 16.			
0	13 27 39.03	1.7931	S. 5 13 12.5	12.637	0	14 56 21.32	1.9226	S. 14 45 57.0	10.918
1	13 29 26.66	1.7945	5 25 50.2	12.620	1	14 58 16.79	1.9264	14 56 50.4	10.862
2	13 31 14.37	1.7960	5 38 26.9	12.602	2	15 0 12.49	1.9304	15 7 40.4	10.805
3	13 33 2.18	1.7976	5 51 2.4	12.582	3	15 2 8.44	1.9344	15 18 27.0	10.747
4	13 34 50.08	1.7992	6 3 36.8	12.563	4	15 4 4.62	1.9383	15 29 10.1	10.689
5	13 36 38.08	1.8009	6 16 10.0	12.542	5	15 6 1.04	1.9423	15 39 49.7	10.629
6	13 38 26.19	1.8027	6 28 41.9	12.522	6	15 7 57.71	1.9465	15 50 25.6	10.568
7	13 40 14.40	1.8044	6 41 12.6	12.500	7	15 9 54.62	1.9507	16 0 57.9	10.507
8	13 42 2.72	1.8062	6 53 41.9	12.477	8	15 11 51.78	1.9547	16 11 26.5	10.445
9	13 43 51.15	1.8082	7 6 9.8	12.453	9	15 13 49.19	1.9589	16 21 51.3	10.382
10	13 45 39.70	1.8101	7 18 36.3	12.429	10	15 15 46.85	1.9632	16 32 12.3	10.318
11	13 47 28.36	1.8121	7 31 1.3	12.404	11	15 17 44.77	1.9675	16 42 29.5	10.253
12	13 49 17.15	1.8142	7 43 24.8	12.378	12	15 19 42.95	1.9717	16 52 42.7	10.187
13	13 51 6.06	1.8163	7 55 46.7	12.352	13	15 21 41.38	1.9761	17 2 51.9	10.120
14	13 52 55.10	1.8185	8 8 7.0	12.325	14	15 23 40.08	1.9805	17 12 57.1	10.052
15	13 54 44.28	1.8207	8 20 25.7	12.297	15	15 25 39.04	1.9849	17 22 58.2	9.983
16	13 56 33.59	1.8229	8 32 42.6	12.267	16	15 27 38.27	1.9893	17 32 55.1	9.914
17	13 58 23.03	1.8252	8 44 57.8	12.238	17	15 29 37.77	1.9938	17 42 47.9	9.844
18	14 0 12.62	1.8277	8 57 11.2	12.207	18	15 31 37.53	1.9983	17 52 36.4	9.772
19	14 2 2.35	1.8301	9 9 22.7	12.177	19	15 33 37.56	2.0028	18 2 20.6	9.700
20	14 3 52.23	1.8326	9 21 32.4	12.145	20	15 35 37.87	2.0074	18 12 0.4	9.627
21	14 5 42.26	1.8352	9 33 40.1	12.112	21	15 37 38.45	2.0120	18 21 35.8	9.552
22	14 7 32.45	1.8378	9 45 45.8	12.078	22	15 39 39.31	2.0167	18 31 6.7	9.477
23	14 9 22.80	1.8404	9 57 49.5	12.044	23	15 41 40.45	2.0212	18 40 33.0	9.401
24	14 11 13.30	1.8431	S. 10 9 51.1	12.009	24	15 43 41.86	2.0258	S. 18 49 54.8	9.324

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	SUNDAY 17.			
	h m s	s	° ′ ″	″
0	15 43 41.86	2.0258	S. 18 49 54.8	9.324
1	15 45 43.55	2.0306	18 59 11.9	9.246
2	15 47 45.53	2.0353	19 8 24.3	9.167
3	15 49 47.79	2.0401	19 17 32.0	9.087
4	15 51 50.34	2.0448	19 26 34.8	9.007
5	15 53 53.17	2.0496	19 35 32.8	8.925
6	15 55 56.29	2.0544	19 44 25.8	8.842
7	15 57 59.70	2.0592	19 53 13.9	8.759
8	16 0 3.40	2.0640	20 1 56.9	8.674
9	16 2 7.38	2.0688	20 10 34.8	8.588
10	16 4 11.66	2.0737	20 19 7.5	8.502
11	16 6 16.23	2.0787	20 27 35.0	8.414
12	16 8 21.10	2.0836	20 35 57.2	8.326
13	16 10 26.26	2.0884	20 44 14.1	8.237
14	16 12 31.71	2.0933	20 52 25.6	8.147
15	16 14 37.46	2.0983	21 0 31.7	8.055
16	16 16 43.51	2.1032	21 8 32.2	7.962
17	16 18 49.85	2.1082	21 16 27.2	7.870
18	16 20 56.49	2.1131	21 24 16.6	7.776
19	16 23 3.42	2.1180	21 32 0.3	7.680
20	16 25 10.65	2.1230	21 39 38.2	7.584
21	16 27 18.18	2.1280	21 47 10.4	7.488
22	16 29 26.01	2.1329	21 54 36.8	7.390
23	16 31 34.13	2.1378	S. 22 1 57.2	7.290
	MONDAY 18.			
0	16 33 42.55	2.1428	S. 22 9 11.6	7.190
1	16 35 51.27	2.1477	22 16 20.0	7.090
2	16 38 0.28	2.1527	22 23 22.4	6.988
3	16 40 9.59	2.1577	22 30 18.6	6.885
4	16 42 19.20	2.1626	22 37 8.6	6.782
5	16 44 29.10	2.1675	22 43 52.4	6.677
6	16 46 39.30	2.1724	22 50 29.9	6.572
7	16 48 49.79	2.1772	22 57 1.0	6.465
8	16 51 0.57	2.1821	23 3 25.7	6.357
9	16 53 11.64	2.1870	23 9 43.9	6.249
10	16 55 23.01	2.1919	23 15 55.6	6.140
11	16 57 34.67	2.1967	23 22 [illegible].7	6.030
12	16 59 46.62	2.2016	23 27 59.2	5.919
13	17 1 58.86	2.2063	23 33 51.0	5.807
14	17 4 11.38	2.2111	23 39 36.0	5.693
15	17 6 24.19	2.2159	23 45 14.2	5.580
16	17 8 37.29	2.2207	23 50 45.6	5.465
17	17 10 50.67	2.2253	23 56 10.0	5.349
18	17 13 4.33	2.2299	24 1 27.5	5.233
19	17 15 18.26	2.2346	24 6 38.0	5.116
20	17 17 32.48	2.2392	24 11 41.4	4.997
21	17 19 46.97	2.2437	24 16 37.6	4.877
22	17 22 1.73	2.2482	24 21 26.7	4.757
23	17 24 16.76	2.2528	24 26 8.5	4.637
24	17 26 32.07	2.2573	S. 24 30 43.1	4.515

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	TUESDAY 19.			
	h m s	s	° ′ ″	″
0	17 26 32.07	2.2573	S. 24 30 43.1	4.515
1	17 28 47.64	2.2617	24 35 10.3	4.392
2	17 31 3.48	2.2661	24 39 30.2	4.269
3	17 33 19.58	2.2704	24 43 42.6	4.144
4	17 35 35.94	2.2747	24 47 47.5	4.019
5	17 37 52.55	2.2790	24 51 44.9	3.893
6	17 40 9.42	2.2832	24 55 34.7	3.767
7	17 42 26.54	2.2874	24 59 16.9	3.639
8	17 44 43.91	2.2915	25 2 51.4	3.511
9	17 47 1.52	2.2955	25 6 18.2	3.382
10	17 49 19.37	2.2996	25 9 37.2	3.252
11	17 51 37.47	2.3036	25 12 48.4	3.122
12	17 53 55.80	2.3075	25 15 51.8	2.990
13	17 56 14.37	2.3113	25 18 47.2	2.857
14	17 58 33.16	2.3151	25 21 34.7	2.725
15	18 0 52.18	2.3188	25 24 14.2	2.591
16	18 3 11.42	2.3225	25 26 45.6	2.457
17	18 5 30.88	2.3261	25 29 9.0	2.322
18	18 7 50.55	2.3297	25 31 24.2	2.186
19	18 10 10.44	2.3332	25 33 31.3	2.050
20	18 12 30.54	2.3367	25 35 30.2	1.912
21	18 14 50.84	2.3399	25 37 20.8	1.775
22	18 17 11.33	2.3432	25 39 3.2	1.637
23	18 19 32.02	2.3465	S. 25 40 37.2	1.497
	WEDNESDAY 20.			
0	18 21 52.91	2.3497	S. 25 42 2.9	1.358
1	18 24 13.98	2.3527	25 43 20.2	1.218
2	18 26 35.24	2.3557	25 44 29.1	1.078
3	18 28 56.67	2.3587	25 45 29.5	0.937
4	18 31 18.28	2.3616	25 46 21.5	0.795
5	18 33 40.06	2.3643	25 47 4.9	0.652
6	18 36 2.00	2.3670	25 47 39.8	0.510
7	18 38 24.10	2.3697	25 48 6.1	0.366
8	18 40 46.36	2.3722	25 48 23.7	0.222
9	18 43 8.77	2.3747	25 48 32.7	−0.078
10	18 45 31.33	2.3772	25 48 33.1	+0.066
11	18 47 54.03	2.3795	25 48 24.8	0.212
12	18 50 16.87	2.3817	25 48 7.7	0.357
13	18 52 39.84	2.3839	25 47 41.9	0.503
14	18 55 2.94	2.3861	25 47 7.3	0.650
15	18 57 26.17	2.3881	25 46 23.9	0.797
16	18 59 49.51	2.3899	25 45 31.7	0.943
17	19 2 12.96	2.3917	25 44 30.7	1.091
18	19 4 36.52	2.3936	25 43 20.8	1.238
19	19 7 0.19	2.3953	25 42 2.1	1.387
20	19 9 23.96	2.3969	25 40 34.4	1.535
21	19 11 47.82	2.3984	25 38 57.9	1.683
22	19 14 11.77	2.3998	25 37 12.4	1.832
23	19 16 35.80	2.4012	25 35 18.0	1.981
24	19 18 59.91	2.4025	S. 25 33 14.7	2.130

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	THURSDAY 21.					SATURDAY 23.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	19 18 59.91	2.4025	S. 25 33 14.7	2.130	0	21 14 20.83	2.3787	S. 20 59 51.4	9.152
1	19 21 24.10	2.4037	25 31 2.4	2.280	1	21 16 43.50	2.3770	20 50 38.2	9.287
2	19 23 48.35	2.4047	25 28 41.1	2.429	2	21 19 6.07	2.3752	20 41 16.9	9.422
3	19 26 12.67	2.4058	25 26 10.9	2.579	3	21 21 28.52	2.3732	20 31 47.6	9.555
4	19 28 37.05	2.4068	25 23 31.6	2.729	4	21 23 50.86	2.3713	20 22 10.3	9.688
5	19 31 1.49	2.4077	25 20 43.4	2.879	5	21 26 13.08	2.3694	20 12 25.0	9.821
6	19 33 25.97	2.4084	25 17 46.1	3.029	6	21 28 35.19	2.3675	20 2 31.8	9.952
7	19 35 50.50	2.4092	25 14 39.9	3.178	7	21 30 57.18	2.3655	19 52 30.7	10.083
8	19 38 15.07	2.4098	25 11 24.7	3.329	8	21 33 19.05	2.3635	19 42 21.8	10.212
9	19 40 39.67	2.4103	25 8 0.4	3.479	9	21 35 40.80	2.3615	19 32 5.2	10.341
10	19 43 4.31	2.4108	25 4 27.2	3.629	10	21 38 2.43	2.3595	19 21 40.9	10.469
11	19 45 28.97	2.4112	25 0 44.9	3.780	11	21 40 23.94	2.3574	19 11 8.9	10.596
12	19 47 53.65	2.4115	24 56 53.6	3.930	12	21 42 45.32	2.3553	19 0 29.4	10.722
13	19 50 18.35	2.4117	24 52 53.3	4.080	13	21 45 6.58	2.3533	18 49 42.3	10.847
14	19 52 43.06	2.4119	24 48 44.0	4.231	14	21 47 27.72	2.3512	18 38 47.8	10.971
15	19 55 7.78	2.4120	24 44 25.6	4.381	15	21 49 48.73	2.3492	18 27 45.8	11.094
16	19 57 32.50	2.4120	24 39 58.3	4.530	16	21 52 9.62	2.3471	18 16 36.5	11.217
17	19 59 57.22	2.4119	24 35 22.0	4.680	17	21 54 30.38	2.3450	18 5 19.8	11.338
18	20 2 21.93	2.4117	24 30 36.7	4.830	18	21 56 51.02	2.3429	17 53 55.9	11.457
19	20 4 46.63	2.4116	24 25 42.4	4.979	19	21 59 11.53	2.3407	17 42 24.9	11.576
20	20 7 11.32	2.4113	24 20 39.2	5.127	20	22 1 31.91	2.3387	17 30 46.8	11.694
21	20 9 35.99	2.4109	24 15 27.1	5.277	21	22 3 52.17	2.3366	17 19 1.6	11.812
22	20 12 0.63	2.4105	24 10 6.0	5.427	22	22 6 12.30	2.3345	17 7 9.4	11.927
23	20 14 25.25	2.4100	S. 24 4 35.9	5.575	23	22 8 32.31	2.3324	S. 16 55 10.3	12.042
	FRIDAY 22.					SUNDAY 24.			
0	20 16 49.83	2.4094	S. 23 58 57.0	5.722	0	22 10 52.19	2.3303	S. 16 43 4.3	12.156
1	20 19 14.38	2.4087	23 53 9.2	5.871	1	22 13 11.95	2.3282	16 30 51.6	12.268
2	20 21 38.89	2.4081	23 47 12.5	6.019	2	22 15 31.58	2.3262	16 18 32.1	12.380
3	20 24 3.35	2.4073	23 41 6.9	6.166	3	22 17 51.10	2.3242	16 6 6.0	12.490
4	20 26 27.76	2.4064	23 34 52.6	6.312	4	22 20 10.49	2.3221	15 53 33.3	12.599
5	20 28 52.12	2.4056	23 28 29.4	6.460	5	22 22 29.75	2.3201	15 40 54.1	12.707
6	20 31 16.43	2.4047	23 21 57.4	6.606	6	22 24 48.90	2.3182	15 28 8.4	12.814
7	20 33 40.68	2.4037	23 15 16.7	6.752	7	22 27 7.93	2.3162	15 15 16.4	12.918
8	20 36 4.87	2.4026	23 8 27.2	6.897	8	22 29 26.84	2.3142	15 2 18.2	13.022
9	20 38 28.99	2.4014	23 1 29.0	7.042	9	22 31 45.63	2.3122	14 49 13.7	13.126
10	20 40 53.04	2.4002	22 54 22.1	7.187	10	22 34 4.31	2.3103	14 36 3.1	13.227
11	20 43 17.02	2.3990	22 47 6.6	7.331	11	22 36 22.87	2.3084	14 22 46.4	13.328
12	20 45 40.92	2.3977	22 39 42.4	7.475	12	22 38 41.32	2.3066	14 9 23.7	13.427
13	20 48 4.74	2.3963	22 32 9.6	7.617	13	22 40 59.66	2.3047	13 55 55.1	13.525
14	20 50 28.48	2.3950	22 24 28.3	7.760	14	22 43 17.89	2.3029	13 42 20.7	13.621
15	20 52 52.14	2.3936	22 16 38.4	7.902	15	22 45 36.01	2.3011	13 28 40.6	13.716
16	20 55 15.71	2.3921	22 8 40.0	8.043	16	22 47 54.02	2.2993	13 14 54.8	13.809
17	20 57 39.19	2.3906	22 0 33.2	8.184	17	22 50 11.93	2.2977	13 1 3.5	13.902
18	21 0 2.58	2.3890	21 52 17.9	8.325	18	22 52 29.74	2.2959	12 47 6.6	13.993
19	21 2 25.87	2.3874	21 43 54.2	8.464	19	22 54 47.44	2.2942	12 33 4.3	14.083
20	21 4 49.07	2.3857	21 35 22.2	8.602	20	22 57 5.05	2.2927	12 18 56.6	14.172
21	21 7 12.16	2.3841	21 26 41.9	8.741	21	22 59 22.57	2.2912	12 4 43.7	14.258
22	21 9 35.16	2.3824	21 17 53.3	8.878	22	23 1 39.99	2.2895	11 50 25.6	14.343
23	21 11 58.05	2.3806	21 8 56.5	9.016	23	23 3 57.31	2.2880	11 36 2.5	14.427
24	21 14 20.83	2.3787	S. 20 59 51.4	9.152	24	23 6 14.55	2.2866	S. 11 21 34.4	14.509

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	MONDAY 25.					WEDNESDAY 27.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	23 6 14.55	2.2866	S. 11 21 34.4	14.509	0	0 55 16.19	2.2785	N. 1 19 14.2	16.519
1	23 8 31.70	2.2852	11 7 1.4	14.590	1	0 57 32.94	2.2799	1 35 45.3	16.517
2	23 10 48.77	2.2837	10 52 23.6	14.670	2	0 59 49.78	2.2813	1 52 16.2	16.512
3	23 13 5.76	2.2824	10 37 41.0	14.748	3	1 2 6.70	2.2827	2 8 46.8	16.506
4	23 15 22.67	2.2812	10 22 53.8	14.824	4	1 4 23.71	2.2842	2 25 16.9	16.497
5	23 17 39.50	2.2799	10 8 2.1	14.899	5	1 6 40.81	2.2858	2 41 46.4	16.486
6	23 19 56.25	2.2787	9 53 5.9	14.973	6	1 8 58.01	2.2874	2 58 15.2	16.473
7	23 22 12.93	2.2775	9 38 5.3	15.045	7	1 11 15.30	2.2891	3 14 43.2	16.459
8	23 24 29.54	2.2763	9 23 0.5	15.115	8	1 13 32.70	2.2909	3 31 10.3	16.442
9	23 26 46.09	2.2753	9 7 51.5	15.183	9	1 15 50.21	2.2927	3 47 36.3	16.423
10	23 29 2.58	2.2743	8 52 38.4	15.251	10	1 18 7.83	2.2946	4 4 1.1	16.402
11	23 31 19.01	2.2733	8 37 21.3	15.317	11	1 20 25.56	2.2965	4 20 24.6	16.380
12	23 33 35.38	2.2724	8 22 0.4	15.381	12	1 22 43.41	2.2985	4 36 46.7	16.356
13	23 35 51.70	2.2716	8 6 35.7	15.442	13	1 25 1.38	2.3006	4 53 7.3	16.329
14	23 38 7.97	2.2707	7 51 7.3	15.503	14	1 27 19.48	2.3027	5 9 26.2	16.301
15	23 40 24.19	2.2700	7 35 35.3	15.562	15	1 29 37.71	2.3049	5 25 43.4	16.271
16	23 42 40.37	2.2693	7 19 59.8	15.620	16	1 31 56.07	2.3071	5 41 58.7	16.237
17	23 44 56.51	2.2687	7 4 20.9	15.676	17	1 34 14.56	2.3094	5 58 11.9	16.203
18	23 47 12.61	2.2681	6 48 38.7	15.730	18	1 36 33.19	2.3117	6 14 23.0	16.167
19	23 49 28.68	2.2675	6 32 53.3	15.782	19	1 38 51.96	2.3140	6 30 31.8	16.128
20	23 51 44.71	2.2670	6 17 4.8	15.832	20	1 41 10.87	2.3165	6 46 38.3	16.087
21	23 54 0.72	2.2667	6 1 13.3	15.882	21	1 43 29.94	2.3190	7 2 42.3	16.045
22	23 56 16.71	2.2663	5 45 19.0	15.929	22	1 45 49.15	2.3215	7 18 43.7	16.000
23	23 58 32.68	2.2660	S. 5 29 21.9	15.974	23	1 48 8.52	2.3242	N. 7 34 42.3	15.952
	TUESDAY 26.					THURSDAY 28.			
0	0 0 48.63	2.2657	S. 5 13 22.1	16.018	0	1 50 28.05	2.3268	N. 7 50 38.0	15.904
1	0 3 4.57	2.2656	4 57 19.7	16.060	1	1 52 47.74	2.3295	8 6 30.8	15.854
2	0 5 20.50	2.2655	4 41 14.9	16.100	2	1 55 7.59	2.3322	8 22 20.5	15.801
3	0 7 36.43	2.2654	4 25 7.7	16.138	3	1 57 27.60	2.3349	8 38 6.9	15.746
4	0 9 52.35	2.2653	4 8 58.3	16.175	4	1 59 47.78	2.3378	8 53 50.0	15.690
5	0 12 8.27	2.2654	3 52 46.7	16.210	5	2 2 8.14	2.3407	9 9 29.7	15.632
6	0 14 24.20	2.2656	3 36 33.1	16.243	6	2 4 28.67	2.3436	9 25 5.8	15.570
7	0 16 40.14	2.2657	3 20 17.6	16.274	7	2 6 49.37	2.3466	9 40 38.2	15.507
8	0 18 56.09	2.2660	3 4 0.2	16.303	8	2 9 10.25	2.3496	9 56 6.7	15.443
9	0 21 12.06	2.2663	2 47 41.1	16.332	9	2 11 31.32	2.3526	10 11 31.3	15.376
10	0 23 28.05	2.2667	2 31 20.4	16.357	10	2 13 52.57	2.3557	10 26 51.8	15.307
11	0 25 44.07	2.2672	2 14 58.2	16.381	11	2 16 14.00	2.3587	10 42 8.2	15.237
12	0 28 0.11	2.2677	1 58 34.7	16.402	12	2 18 35.62	2.3619	10 57 20.3	15.165
13	0 30 16.19	2.2682	1 42 9.9	16.423	13	2 20 57.43	2.3651	11 12 28.0	15.091
14	0 32 32.30	2.2688	1 25 43.9	16.442	14	2 23 19.43	2.3683	11 27 31.2	15.014
15	0 34 48.45	2.2695	1 9 16.9	16.457	15	2 25 41.63	2.3716	11 42 29.7	14.936
16	0 37 4.64	2.2702	0 52 49.0	16.472	16	2 28 4.02	2.3748	11 57 23.5	14.856
17	0 39 20.88	2.2711	0 36 20.3	16.485	17	2 30 26.60	2.3781	12 12 12.4	14.773
18	0 41 37.17	2.2720	0 19 50.8	16.496	18	2 32 49.38	2.3815	12 26 56.3	14.689
19	0 43 53.52	2.2729	S. 0 3 20.8	16.504	19	2 35 12.37	2.3847	12 41 35.1	14.603
20	0 46 9.92	2.2738	N. 0 13 9.7	16.512	20	2 37 35.56	2.3881	12 56 8.7	14.516
21	0 48 26.38	2.2750	0 29 40.6	16.517	21	2 39 58.95	2.3916	13 10 37.0	14.426
22	0 50 42.92	2.2762	0 46 11.7	16.520	22	2 42 22.55	2.3950	13 24 59.8	14.334
23	0 52 59.52	2.2773	1 2 43.0	16.521	23	2 44 46.35	2.3983	13 39 17.1	14.242
24	0 55 16.19	2.2785	N. 1 19 14.2	16.519	24	2 47 10.35	2.4017	N. 13 53 28.8	14.146

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

FRIDAY 29.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	2 47 10.35	2.4017	N.13 53 28.8	14.146
1	2 49 34.56	2.4052	14 7 34.6	14.047
2	2 51 58.97	2.4087	14 21 34.5	13.948
3	2 54 23.60	2.4122	14 35 28.4	13.847
4	2 56 48.43	2.4156	14 49 16.2	13.746
5	2 59 13.47	2.4191	15 2 57.9	13.642
6	3 1 38.72	2.4225	15 16 33.3	13.536
7	3 4 4.17	2.4260	15 30 2.2	13.427
8	3 6 29.84	2.4296	15 43 24.6	13.318
9	3 8 55.72	2.4331	15 56 40.4	13.207
10	3 11 21.81	2.4365	16 9 49.5	13.095
11	3 13 48.10	2.4400	16 22 51.8	12.980
12	3 16 14.61	2.4435	16 35 47.1	12.862
13	3 18 41.32	2.4469	16 48 35.3	12.744
14	3 21 8.24	2.4503	17 1 16.4	12.625
15	3 23 35.36	2.4537	17 13 50.3	12.504
16	3 26 2.69	2.4572	17 26 16.9	12.381
17	3 28 30.22	2.4606	17 38 36.0	12.256
18	3 30 57.96	2.4639	17 50 47.6	12.131
19	3 33 25.89	2.4672	18 2 51.7	12.003
20	3 35 54.02	2.4705	18 14 48.0	11.873
21	3 38 22.35	2.4737	18 26 36.5	11.743
22	3 40 50.87	2.4770	18 38 17.2	11.612
23	3 43 19.59	2.4802	N.18 49 49.9	11.477

SATURDAY 30.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	3 45 48.50	2.4834	N.19 1 14.5	11.342
1	3 48 17.60	2.4865	19 12 31.0	11.207
2	3 50 46.88	2.4896	19 23 39.3	11.069
3	3 53 16.35	2.4927	19 34 39.3	10.931
4	3 55 46.00	2.4957	19 45 31.0	10.791
5	3 58 15.83	2.4986	19 56 14.2	10.648
6	4 0 45.83	2.5014	20 6 48.8	10.505
7	4 3 16.00	2.5042	20 17 14.8	10.362
8	4 5 46.34	2.5070	20 27 32.2	10.217
9	4 8 16.84	2.5097	20 37 40.8	10.070
10	4 10 47.51	2.5124	20 47 40.6	9.922
11	4 13 18.33	2.5150	20 57 31.5	9.773
12	4 15 49.31	2.5176	21 7 13.4	9.623
13	4 18 20.44	2.5200	21 16 46.3	9.472
14	4 20 51.71	2.5224	21 26 10.1	9.320
15	4 23 23.13	2.5248	21 35 24.7	9.167
16	4 25 54.69	2.5270	21 44 30.1	9.012
17	4 28 26.37	2.5292	21 53 26.2	8.857
18	4 30 58.19	2.5313	22 2 13.0	8.702
19	4 33 30.13	2.5332	22 10 50.5	8.546
20	4 36 2.18	2.5352	22 19 18.5	8.387
21	4 38 34.35	2.5371	22 27 37.0	8.228
22	4 41 6.63	2.5388	22 35 45.9	8.069
23	4 43 39.01	2.5405	22 43 45.3	7.909
24	4 46 11.49	2.5421	N.22 51 35.0	7.748

SUNDAY 31.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	4 46 11.49	2.5421	N.22 51 35.0	7.748
1	4 48 44.06	2.5436	22 59 15.1	7.587
2	4 51 16.72	2.5450	23 6 45.4	7.424
3	4 53 49.46	2.5462	23 14 6.0	7.262
4	4 56 22.27	2.5474	23 21 16.8	7.098
5	4 58 55.15	2.5485	23 28 17.8	6.934
6	5 1 28.09	2.5495	23 35 8.9	6.769
7	5 4 1.09	2.5504	23 41 50.1	6.604
8	5 6 34.14	2.5512	23 48 21.4	6.438
9	5 9 7.23	2.5518	23 54 42.7	6.272
10	5 11 40.36	2.5524	24 0 54.1	6.106
11	5 14 13.52	2.5529	24 6 55.4	5.938
12	5 16 46.71	2.5533	24 12 46.7	5.772
13	5 19 19.92	2.5535	24 18 28.0	5.604
14	5 21 53.13	2.5536	24 23 59.2	5.436
15	5 24 26.35	2.5537	24 29 20.3	5.267
16	5 26 59.57	2.5536	24 34 31.3	5.099
17	5 29 32.78	2.5534	24 39 32.2	4.931
18	5 32 5.98	2.5531	24 44 23.0	4.762
19	5 34 39.15	2.5526	24 49 3.7	4.593
20	5 37 12.29	2.5521	24 53 34.2	4.424
21	5 39 45.40	2.5514	24 57 54.6	4.256
22	5 42 18.46	2.5506	25 2 4.9	4.087
23	5 44 51.47	2.5497	N.25 6 5.0	3.917

MONDAY, NOVEMBER 1.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	5 47 24.42	2.5487	N.25 9 55.0	3.749

PHASES OF THE MOON.

			d	h	m
☾	Last Quarter . . .	Oct.	5	18	44.2
●	New Moon		13	20	13.4
☽	First Quarter		21	19	3.6
○	Full Moon		28	10	7.0

			d	h
☾	Apogee	Oct.	12	23.6
☾	Perigee		27	16.7

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	III^{h}	P. L. of Diff.	VI^{h}	P. L. of Diff.	IX^{h}	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
1	α Aquilæ	W.	95 44 32	2825	97 18 28	2846	98 51 57	2866	100 24 59	2888
	Fomalhaut	W.	63 45 48	2254	65 32 55	2260	67 19 54	2266	69 6 43	2274
	α Pegasi	W.	47 58 13	2817	49 32 19	2786	51 7 5	2761	52 42 24	2740
	Mars	W.	36 43 20	1966	38 37 48	1977	40 31 58	1989	42 25 48	2002
	Pollux	E.	76 54 50	2048	75 2 30	2060	73 10 28	2072	71 18 45	2084
	Regulus	E.	113 3 41	2056	111 11 34	2068	109 19 45	2079	107 28 13	2091
2	Fomalhaut	W.	77 57 29	2328	79 42 48	2342	81 27 47	2356	83 12 26	2371
	α Pegasi	W.	60 44 20	2687	62 21 17	2685	63 58 17	2685	65 35 17	2687
	Mars	W.	51 49 46	2074	53 41 25	2089	55 32 41	2105	57 23 32	2121
	Saturn	W.	29 40 5	2127	31 30 23	2143	33 20 17	2159	35 9 47	2175
	Pollux	E.	62 5 20	2157	60 15 47	2173	58 26 38	2189	56 37 54	2206
	Regulus	E.	98 15 35	2161	96 26 9	2177	94 37 7	2193	92 48 29	2209
3	Fomalhaut	W.	91 50 0	2454	93 32 18	2473	95 14 9	2492	96 55 33	2511
	α Pegasi	W.	73 38 51	2722	75 15 2	2732	76 51 0	2744	78 26 42	2757
	Mars	W.	66 31 28	2207	68 19 45	2225	70 7 35	2243	71 54 59	2261
	Saturn	W.	44 11 7	2260	45 58 6	2277	47 44 40	2294	49 30 48	2312
	Pollux	E.	47 40 34	2294	45 54 26	2313	44 8 45	2331	42 23 31	2350
	Regulus	E.	83 51 29	2295	82 5 22	2313	80 19 42	2331	78 34 28	2349
	Sun	E.	124 54 49	2613	123 16 12	2632	121 38 0	2651	120 0 14	2670
4	Fomalhaut	W.	105 15 41	2614	106 54 17	2636	108 32 23	2658	110 9 59	2681
	α Pegasi	W.	86 20 36	2833	87 54 21	2851	89 27 43	2869	91 0 42	2887
	Mars	W.	80 45 14	2353	82 29 56	2371	84 14 13	2389	85 58 3	2407
	Saturn	W.	58 14 53	2403	59 58 23	2421	61 41 28	2439	63 24 7	2458
	α Arietis	W.	42 58 59	2657	44 36 37	2663	46 14 7	2669	47 51 29	2676
	Pollux	E.	33 44 23	2450	32 1 59	2471	30 20 4	2492	28 38 39	2513
	Regulus	E.	69 54 56	2442	68 12 21	2461	66 30 13	2480	64 48 31	2498
	Sun	E.	111 57 45	2766	110 22 32	2785	108 47 45	2804	107 13 22	2824
5	α Pegasi	W.	98 39 28	2988	100 9 56	3010	101 39 56	3033	103 9 28	3055
	Mars	W.	94 30 48	2497	96 12 5	2515	97 52 58	2532	99 33 27	2548
	Saturn	W.	71 51 3	2546	73 31 12	2563	75 10 58	2580	76 50 20	2596
	α Arietis	W.	55 55 25	2726	57 31 30	2738	59 7 19	2750	60 42 53	2762
	Aldebaran	W.	24 43 39	2675	26 20 53	2682	27 57 57	2690	29 34 51	2699
	Regulus	E.	56 26 30	2591	54 47 23	2609	53 8 40	2626	51 30 21	2645
	Sun	E.	99 27 43	2919	97 55 48	2938	96 24 17	2956	94 53 9	2974
6	Mars	W.	107 50 7	2631	109 28 20	2646	111 6 13	2661	112 43 45	2676
	Saturn	W.	85 1 35	2677	86 38 45	2692	88 15 35	2707	89 52 5	2722
	α Arietis	W.	68 36 35	2826	70 10 29	2839	71 44 6	2852	73 17 27	2864
	Aldebaran	W.	37 36 5	2753	39 11 34	2765	40 46 48	2777	42 21 46	2789
	Regulus	E.	43 24 47	2733	41 48 51	2750	40 13 18	2768	38 38 8	2785
	Sun	E.	87 23 4	3061	85 54 8	3078	84 25 31	3094	82 57 14	3110
7	Saturn	W.	97 49 53	2791	99 24 33	2803	100 58 57	2815	102 33 5	2827
	α Arietis	W.	81 0 8	2927	82 31 53	2939	84 3 23	2950	85 34 38	2962
	Aldebaran	W.	50 12 39	2849	51 46 3	2860	53 19 13	2871	54 52 9	2882
	Regulus	E.	30 47 54	2873	29 15 0	2891	27 42 29	2910	26 10 23	2930
	Sun	E.	75 40 35	3185	74 14 9	3199	72 47 59	3213	71 22 6	3226

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XV^h	P. L. of Diff.	XVIII^h	P. L. of Diff.	XXI^h	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
1	α Aquilæ	W.	101 57 33	2912	103 29 36	2939	105 1 5	2968	106 31 58	2999
	Fomalhaut	W.	70 53 21	2283	72 39 46	2293	74 25 56	2303	76 11 51	2315
	α Pegasi	W.	54 18 11	2722	55 54 21	2709	57 30 49	2699	59 7 30	2692
	Mars	W.	44 19 19	2016	46 12 29	2030	48 5 17	2044	49 57 43	2059
	Pollux	E.	69 27 21	2098	67 36 18	2112	65 45 37	2126	63 55 17	2141
	Regulus	E.	105 37 0	2104	103 46 7	2118	101 55 35	2132	100 5 24	2146
2	Fomalhaut	W.	84 56 43	2387	86 40 38	2403	88 24 9	2419	90 7 17	2436
	α Pegasi	W.	67 12 14	2691	68 49 6	2696	70 25 51	2703	72 2 27	2712
	Mars	W.	59 13 59	2138	61 4 0	2155	62 53 35	2172	64 42 45	2190
	Saturn	W.	36 58 52	2191	38 47 33	2208	40 35 50	2225	42 23 41	2242
	Pollux	E.	54 49 34	2223	53 1 40	2240	51 14 12	2258	49 27 10	2276
	Regulus	E.	91 0 15	2226	89 12 26	2243	87 25 2	2260	85 38 3	2277
3	Fomalhaut	W.	98 36 31	2531	100 17 1	2551	101 57 3	2572	103 36 37	2593
	α Pegasi	W.	80 2 7	2771	81 37 13	2785	83 12 1	2800	84 46 29	2816
	Mars	W.	73 41 56	2279	75 28 26	2297	77 14 29	2316	79 0 5	2335
	Saturn	W.	51 16 30	2331	53 1 45	2348	54 46 34	2366	56 30 56	2384
	Pollux	E.	40 38 45	2370	38 54 27	2390	37 10 37	2410	35 27 16	2430
	Regulus	E.	76 49 40	2368	75 5 19	2387	73 21 25	2405	71 37 58	2423
	Sun	E.	118 22 53	2689	116 45 58	2708	115 9 28	2727	113 33 24	2746
4	Fomalhaut	W.	111 47 5	2704	113 23 40	2728	114 59 43	2751	116 35 15	2775
	α Pegasi	W.	92 33 18	2906	94 5 29	2927	95 37 14	2947	97 8 34	2967
	Mars	W.	87 41 28	2425	89 24 26	2443	91 6 59	2462	92 49 6	2480
	Saturn	W.	65 6 20	2475	66 48 8	2493	68 29 31	2511	70 10 29	2528
	α Arietis	W.	49 28 41	2684	51 5 42	2694	52 42 30	2704	54 19 5	2715
	Pollux	E.	26 57 43	2535	25 17 19	2558	23 37 26	2581	21 58 5	2604
	Regulus	E.	63 7 15	2517	61 26 26	2535	59 46 2	2553	58 6 3	2572
	Sun	E.	105 39 25	2843	104 5 53	2862	102 32 45	2881	101 0 2	2900
5	α Pegasi	W.	104 38 33	3078	106 7 9	3102	107 35 16	3126	109 2 53	3150
	Mars	W.	101 13 33	2565	102 53 16	2582	104 32 35	2599	106 11 32	2615
	Saturn	W.	78 29 20	2613	80 7 57	2630	81 46 11	2646	83 24 4	2662
	α Arietis	W.	62 18 11	2775	63 53 12	2788	65 27 56	2800	67 2 24	2813
	Aldebaran	W.	31 11 33	2708	32 48 2	2718	34 24 18	2729	36 0 19	2741
	Regulus	E.	49 52 27	2663	48 14 57	2680	46 37 50	2698	45 1 7	2715
	Sun	E.	93 22 24	2992	91 52 1	3010	90 22 1	3027	88 52 22	3044
6	Mars	W.	114 20 57	2690	115 57 50	2705	117 34 23	2719	119 10 37	2732
	Saturn	W.	91 28 16	2736	93 4 8	2750	94 39 41	2764	96 14 56	2778
	α Arietis	W.	74 50 32	2877	76 23 20	2890	77 55 51	2902	79 28 7	2914
	Aldebaran	W.	43 56 28	2801	45 30 54	2813	47 5 4	2825	48 38 59	2837
	Regulus	E.	37 3 20	2802	35 28 55	2819	33 54 52	2837	32 21 11	2855
	Sun	E.	81 29 17	3126	80 1 39	3142	78 34 20	3157	77 7 19	3171
7	Saturn	W.	104 6 57	2839	105 40 34	2850	107 13 56	2861	108 47 5	2872
	α Arietis	W.	87 5 38	2973	88 36 24	2985	90 6 56	2996	91 37 14	3006
	Aldebaran	W.	56 24 51	2893	57 57 19	2904	59 29 33	2914	61 1 34	2924
	Regulus	E.	24 38 41	2951	23 7 26	2974	21 36 41	2999	20 6 28	3026
	Sun	E.	69 56 28	3239	68 31 6	3252	67 5 58	3264	65 41 4	3276

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	III^h	P. L. of Diff.	VI^h	P. L. of Diff.	IX^h	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
8	Saturn	W.	110 20 0	2882	111 52 41	2892	113 25 10	2901	114 57 27	2911
	α Arietis	W.	93 7 19	3017	94 37 11	3028	96 6 49	3038	97 36 15	3048
	Aldebaran	W.	62 33 23	2933	64 5 0	2942	65 36 25	2951	67 7 39	2960
	Pollux	W.	18 26 52	2971	19 57 41	2974	21 28 26	2977	22 59 7	2981
	Sun	E.	64 16 24	3288	62 51 58	3299	61 27 45	3309	60 3 44	3319
9	α Arietis	W.	105 0 25	3095	106 28 40	3104	107 56 45	3113	109 24 39	3122
	Aldebaran	W.	74 41 8	3000	76 11 21	3007	77 41 25	3013	79 11 21	3019
	Pollux	W.	30 31 17	3004	32 1 25	3009	33 31 26	3014	35 1 21	3020
	Sun	E.	53 6 32	3367	51 43 38	3375	50 20 53	3383	48 58 18	3391
10	Aldebaran	W.	86 39 12	3047	88 8 26	3052	89 37 34	3056	91 6 37	3060
	Pollux	W.	42 29 24	3042	43 58 44	3046	45 28 0	3050	46 57 11	3053
	Sun	E.	42 7 27	3426	40 45 40	3433	39 24 1	3439	38 2 29	3445
11	Aldebaran	W.	98 30 40	3078	99 59 16	3081	101 27 49	3084	102 56 19	3086
	Pollux	W.	54 22 5	3068	55 50 53	3070	57 19 39	3072	58 48 22	3074
	Sun	E.	31 16 28	3475	29 55 36	3481	28 34 50	3487	27 14 11	3494
16	Sun	W.	23 34 15	3447	24 55 38	3438	26 17 12	3428	27 38 57	3419
	Fomalhaut	E.	106 11 7	3201	104 44 59	3194	103 18 43	3187	101 52 18	3180
17	Sun	W.	34 30 18	3374	35 53 4	3365	37 16 1	3356	38 39 8	3347
	Fomalhaut	E.	94 38 9	3145	93 10 55	3138	91 43 32	3132	90 16 1	3125
	α Pegasi	E.	112 28 10	3452	111 6 52	3437	109 45 17	3422	108 23 25	3407
	Mars	E.	117 47 44	2943	116 16 20	2938	114 44 49	2932	113 13 11	2926
18	Sun	W.	45 37 17	3301	47 1 27	3292	48 25 48	3282	49 50 21	3271
	Fomalhaut	E.	82 56 23	3091	81 28 3	3084	79 59 34	3078	78 30 57	3071
	α Pegasi	E.	101 30 3	3340	100 6 38	3328	98 42 59	3316	97 19 6	3304
	Mars	E.	105 32 58	2892	104 0 29	2884	102 27 51	2876	100 55 2	2868
19	Sun	W.	56 56 11	3217	58 22 0	3205	59 48 3	3193	61 14 21	3181
	Fomalhaut	E.	71 5 47	3038	69 36 21	3031	68 6 46	3025	66 37 4	3019
	α Pegasi	E.	90 16 25	3251	88 51 16	3241	87 25 55	3231	86 0 23	3222
	Mars	E.	93 8 17	2825	91 34 21	2815	90 0 12	2805	88 25 50	2795
	Saturn	E.	116 48 15	2818	115 14 11	2807	113 39 52	2796	112 5 20	2785
20	Sun	W.	68 29 35	3115	69 57 26	3102	71 25 33	3087	72 53 58	3073
	Fomalhaut	E.	59 6 46	2992	57 36 23	2988	56 5 55	2985	54 35 24	2982
	α Pegasi	E.	78 50 4	3180	77 23 31	3173	75 56 50	3166	74 30 0	3160
	Mars	E.	80 30 33	2739	78 54 45	2727	77 18 42	2715	75 42 22	2702
	Saturn	E.	104 8 55	2727	102 32 51	2714	100 56 31	2701	99 19 53	2688
21	Sun	W.	80 20 37	2997	81 50 54	2981	83 21 31	2965	84 52 28	2949
	Fomalhaut	E.	47 2 18	2985	45 31 46	2990	44 1 19	2996	42 31 1	3005
	α Pegasi	E.	67 14 14	3138	65 46 51	3137	64 19 26	3136	62 52 0	3137
	Mars	E.	67 36 25	2637	65 58 20	2623	64 19 56	2608	62 41 12	2594
	Saturn	E.	91 12 15	2619	89 33 46	2605	87 54 58	2590	86 15 49	2575
22	Sun	W.	92 32 33	2862	94 5 40	2845	95 39 9	2828	97 13 1	2810
	Mars	E.	54 22 34	2520	52 41 48	2504	51 0 41	2489	49 19 12	2473

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XV^h	P. L. of Diff.	XVIII^h	P. L. of Diff.	XXI^h	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
8	SATURN	W.	116 29 32	2920	118 1 26	2928	119 33 9	2936	121 4 41	2944
	a Arietis	W.	99 5 29	3058	100 34 30	3067	102 3 20	3077	103 31 58	3086
	Aldebaran	W.	68 38 41	2969	70 9 32	2977	71 40 14	2985	73 10 46	2993
	Pollux	W.	24 29 44	2985	26 0 16	2989	27 30 43	2994	29 1 3	2999
	SUN	E.	58 39 55	3329	57 16 18	3339	55 52 52	3349	54 29 37	3358
9	*a* Arietis	W.	110 52 22	3131	112 19 54	3139	113 47 16	3148	115 14 28	3156
	Aldebaran	W.	80 41 10	3026	82 10 51	3032	83 40 24	3037	85 9 51	3042
	Pollux	W.	36 31 9	3025	38 0 51	3030	39 30 27	3034	40 59 58	3038
	SUN	E.	47 35 51	3399	46 13 33	3406	44 51 23	3413	43 29 21	3420
10	Aldebaran	W.	92 35 35	3065	94 4 28	3069	95 33 16	3072	97 2 0	3075
	Pollux	W.	48 26 18	3057	49 55 20	3060	51 24 18	3063	52 53 13	3066
	SUN	E.	36 41 3	3451	35 19 44	3457	33 58 32	3463	32 37 27	3469
11	Aldebaran	W.	104 24 45	3088	105 53 9	3090	107 21 30	3092	108 49 49	3093
	Pollux	W.	60 17 3	3076	61 45 42	3078	63 14 19	3079	64 42 55	3080
	SUN	E.	25 53 40	3501	24 33 17	3509	23 13 3	3517	21 52 58	3525
16	SUN	W.	29 0 52	3409	30 22 58	3400	31 45 14	3391	33 7 41	3382
	Fomalhaut	E.	100 25 45	3173	98 59 4	3166	97 32 14	3159	96 5 16	3152
17	SUN	W.	40 2 25	3338	41 25 52	3329	42 49 29	3320	44 13 18	3311
	Fomalhaut	E.	88 48 22	3119	87 20 35	3112	85 52 39	3105	84 24 35	3098
	a Pegasi	E.	107 1 16	3393	105 38 51	3379	104 16 10	3365	102 53 14	3352
	MARS	E.	111 41 25	2920	110 9 31	2913	108 37 29	2906	107 5 18	2899
18	SUN	W.	51 15 6	3261	52 40 3	3250	54 5 12	3239	55 30 35	3228
	Fomalhaut	E.	77 2 12	3064	75 33 18	3057	74 4 16	3051	72 35 6	3044
	a Pegasi	E.	95 54 59	3293	94 30 39	3282	93 6 7	3271	91 41 22	3261
	MARS	E.	99 22 3	2860	97 48 53	2852	96 15 33	2843	94 42 1	2834
19	SUN	W.	62 40 53	3168	64 7 40	3156	65 34 42	3143	67 2 0	3129
	Fomalhaut	E.	65 7 15	3013	63 37 18	3007	62 7 14	3002	60 37 3	2997
	a Pegasi	E.	84 34 40	3213	83 8 46	3204	81 42 42	3196	80 16 28	3188
	MARS	E.	86 51 15	2784	85 16 26	2773	83 41 23	2762	82 6 5	2751
	SATURN	E.	110 30 33	2774	108 55 32	2763	107 20 15	2751	105 44 43	2739
20	SUN	W.	74 22 41	3058	75 51 42	3043	77 21 1	3028	78 50 39	3012
	Fomalhaut	E.	53 4 49	2981	51 34 12	2979	50 3 33	2979	48 32 54	2981
	a Pegasi	E.	73 3 3	3154	71 35 59	3149	70 8 49	3145	68 41 34	3141
	MARS	E.	74 5 45	2690	72 28 52	2677	70 51 41	2663	69 14 12	2650
	SATURN	E.	97 42 58	2675	96 5 45	2662	94 28 14	2648	92 50 24	2634
21	SUN	W.	86 23 46	2931	87 55 25	2914	89 27 26	2898	90 59 48	2880
	Fomalhaut	E.	41 0 55	3018	39 31 5	3035	38 1 35	3056	36 32 30	3083
	a Pegasi	E.	61 24 35	3138	59 57 12	3142	58 29 53	3147	57 2 40	3154
	MARS	E.	61 2 9	2580	59 22 46	2565	57 43 3	2550	56 2 59	2535
	SATURN	E.	84 36 20	2560	82 56 30	2545	81 16 19	2529	79 35 47	2513
22	SUN	W.	98 47 16	2792	100 21 54	2774	101 56 56	2756	103 32 21	2738
	MARS	E.	47 37 21	2458	45 55 8	2442	44 12 34	2426	42 29 37	2411

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	III^h	P. L. of Diff.	VI^h	P. L. of Diff.	IX^h	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
22	*a* Pegasi	E.	55 35 35	3163	54 8 41	3175	52 42 2	3189	51 15 40	3207
	SATURN	E.	77 54 52	2497	76 13 35	2481	74 31 55	2465	72 49 52	2448
	a Arietis	E.	96 1 40	2629	94 23 25	2612	92 44 47	2596	91 5 46	2579
23	SUN	W.	105 8 10	2720	106 44 23	2702	108 21 0	2684	109 58 1	2666
	MARS	E.	40 46 18	2396	39 2 37	2380	37 18 33	2365	35 34 7	2350
	SATURN	E.	64 13 49	2366	62 29 25	2350	60 44 38	2333	58 59 27	2316
	a Arietis	E.	82 45 2	2498	81 3 46	2482	79 22 8	2467	77 40 8	2452
	Aldebaran	E.	113 11 49	2413	111 28 33	2395	109 44 51	2378	108 0 44	2361
24	SUN	W.	118 9 6	2579	119 48 30	2563	121 28 16	2546	123 8 26	2529
	SATURN	E.	50 7 29	2235	48 19 54	2219	46 31 55	2204	44 43 33	2189
	a Arietis	E.	69 4 58	2381	67 20 56	2368	65 36 36	2356	63 51 59	2345
	Aldebaran	E.	99 14 3	2278	97 27 30	2262	95 40 34	2246	93 53 15	2230
25	*a* Aquilæ	W.	53 33 58	3474	54 54 51	3400	56 17 8	3332	57 40 42	3270
	SATURN	E.	35 36 10	2117	33 45 37	2104	31 54 44	2092	30 3 32	2080
	a Arietis	E.	55 5 9	2302	53 19 12	2296	51 33 6	2292	49 46 54	2290
	Aldebaran	E.	84 50 57	2157	83 1 25	2144	81 11 33	2131	79 21 21	2119
26	*a* Aquilæ	W.	64 55 0	3027	66 24 39	2989	67 55 5	2956	69 26 13	2926
	Aldebaran	E.	70 5 58	2066	68 14 6	2057	66 22 1	2049	64 29 43	2042
	Pollux	E.	114 13 17	2051	112 21 2	2041	110 28 31	2032	108 35 46	2023
27	*a* Aquilæ	W.	77 10 26	2813	78 44 37	2798	80 19 7	2786	81 53 53	2777
	MARS	W.	17 46 15	2036	19 38 53	2028	21 31 44	2021	23 24 46	2015
	Aldebaran	E.	55 5 50	2018	53 12 43	2016	51 19 33	2015	49 26 21	2014
	Pollux	E.	99 9 12	1993	97 15 27	1989	95 21 36	1986	93 27 40	1984
28	*a* Aquilæ	W.	89 49 54	2761	91 25 13	2765	93 0 26	2772	94 35 31	2781
	MARS	W.	32 51 24	2007	34 44 47	2009	36 38 7	2012	38 31 23	2016
	Aldebaran	E.	40 0 47	2029	38 7 58	2036	36 15 21	2045	34 22 56	2055
	Pollux	E.	83 57 30	1984	82 3 31	1987	80 9 36	1990	78 15 46	1994
	Regulus	E.	120 5 36	1997	118 11 57	1999	116 18 21	2002	114 24 49	2005
29	*a* Aquilæ	W.	102 27 14	2857	104 0 28	2879	105 33 15	2904	107 5 30	2932
	MARS	W.	47 55 48	2047	49 48 9	2056	51 40 16	2065	53 32 9	2075
	SATURN	W.	25 2 22	2003	26 55 52	2010	28 49 10	2019	30 42 14	2029
	Pollux	E.	68 48 37	2027	66 55 44	2035	65 3 4	2044	63 10 39	2055
	Regulus	E.	104 58 55	2035	103 6 15	2043	101 13 48	2052	99 21 35	2062
30	MARS	W.	62 47 18	2136	64 37 22	2150	66 27 4	2165	68 16 24	2180
	SATURN	W.	40 3 29	2087	41 54 48	2100	43 45 47	2114	45 36 25	2130
	Pollux	E.	53 52 53	2116	52 2 18	2130	50 12 5	2145	48 22 14	2160
	Regulus	E.	90 4 36	2121	88 14 9	2135	86 24 3	2149	84 34 18	2164
	JUPITER	E.	125 18 33	2176	123 29 30	2191	121 40 49	2205	119 52 29	2219
31	MARS	W.	77 17 7	2264	79 4 0	2282	80 50 27	2300	82 36 27	2318
	SATURN	W.	54 43 42	2209	56 31 56	2226	58 19 45	2243	60 7 8	2261
	Pollux	E.	39 19 2	2245	37 31 42	2264	35 44 49	2283	33 58 24	2302
	Regulus	E.	75 31 24	2245	73 44 3	2263	71 57 9	2281	70 10 41	2299
	JUPITER	E.	110 56 25	2299	109 10 24	2316	107 24 48	2334	105 39 38	2352

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XV^{h}	P. L. of Diff.	XVIII^{h}	P. L. of Diff.	XXI^{h}	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
22	α Pegasi	E.	49 49 39	3229	48 24 4	3255	46 58 59	3285	45 34 30	3320
	Saturn	E.	71 7 26	2432	69 24 37	2416	67 41 25	2399	65 57 49	2382
	α Arietis	E.	89 26 22	2563	87 46 36	2546	86 6 27	2530	84 25 56	2514
23	Sun	W.	111 35 27	2649	113 13 16	2631	114 51 29	2613	116 30 6	2596
	Mars	E.	33 49 20	2335	32 4 11	2320	30 18 41	2306	28 32 49	2292
	Saturn	E.	57 13 51	2300	55 27 52	2283	53 41 28	2267	51 54 40	2251
	α Arietis	E.	75 57 47	2437	74 15 5	2423	72 32 3	2409	70 48 40	2395
	Aldebaran	E.	106 16 12	2344	104 31 16	2327	102 45 56	2311	101 0 12	2294
24	Sun	W.	124 48 59	2513	126 29 54	2497	128 11 11	2482	129 52 50	2467
	Saturn	E.	42 54 49	2174	41 5 42	2159	39 16 13	2145	37 26 22	2131
	α Arietis	E.	62 7 5	2335	60 21 56	2325	58 36 32	2316	56 50 56	2309
	Aldebaran	E.	92 5 32	2215	90 17 26	2200	88 28 58	2185	86 40 8	2171
25	α Aquilæ	W.	59 5 28	3214	60 31 21	3161	61 58 17	3113	63 26 11	3068
	Saturn	E.	28 12 2	2068	26 20 14	2057	24 28 9	2047	22 35 48	2037
	α Arietis	E.	48 0 40	2289	46 14 25	2290	44 28 11	2294	42 42 2	2300
	Aldebaran	E.	77 30 51	2107	75 40 3	2096	73 48 57	2085	71 57 35	2075
26	α Aquilæ	W.	70 57 59	2898	72 30 20	2873	74 3 14	2850	75 36 37	2830
	Aldebaran	E.	62 37 14	2036	60 44 35	2030	58 51 47	2025	56 58 52	2021
	Pollux	E.	106 42 48	2016	104 49 39	2009	102 56 19	2003	101 2 50	1998
27	α Aquilæ	W.	83 28 51	2770	85 3 59	2764	86 39 14	2761	88 14 33	2760
	Mars	W.	25 17 57	2011	27 11 15	2009	29 4 36	2007	30 57 59	2006
	Aldebaran	E.	47 33 8	2015	45 39 56	2017	43 46 48	2020	41 53 45	2024
	Pollux	E.	91 33 40	1982	89 39 38	1982	87 45 35	1982	85 51 32	1983
28	α Aquilæ	W.	96 10 24	2791	97 45 4	2803	99 19 29	2818	100 53 34	2837
	Mars	W.	40 24 33	2020	42 17 36	2026	44 10 30	2032	46 3 14	2039
	Aldebaran	E.	32 30 47	2067	30 38 57	2082	28 47 30	2099	26 56 29	2118
	Pollux	E.	76 22 2	1999	74 28 26	2005	72 34 59	2011	70 41 42	2019
	Regulus	E.	112 31 22	2009	110 38 2	2014	108 44 50	2020	106 51 47	2027
29	α Aquilæ	W.	108 37 8	2962	110 8 8	2995	111 38 27	3031	113 8 1	3071
	Mars	W.	55 23 47	2086	57 15 8	2098	59 6 10	2110	60 56 54	2123
	Saturn	W.	32 35 3	2039	34 27 36	2050	36 19 52	2062	38 11 50	2074
	Pollux	E.	61 18 30	2066	59 26 38	2077	57 35 4	2089	55 43 49	2102
	Regulus	E.	97 29 37	2072	95 37 55	2083	93 46 30	2095	91 55 23	2108
30	Mars	W.	70 5 21	2196	71 53 54	2212	73 42 3	2229	75 29 48	2246
	Saturn	W.	47 26 39	2145	49 16 31	2160	51 5 59	2176	52 55 3	2192
	Pollux	E.	46 32 45	2176	44 43 41	2193	42 55 2	2210	41 6 49	2227
	Regulus	E.	82 44 56	2179	80 55 57	2195	79 7 21	2211	77 19 10	2228
	Jupiter	E.	118 4 30	2234	116 16 54	2250	114 29 40	2266	112 42 50	2283
31	Mars	W.	84 22 1	2337	86 7 7	2356	87 51 45	2375	89 35 55	2394
	Saturn	W.	61 54 5	2279	63 40 35	2298	65 26 38	2316	67 12 14	2335
	Pollux	E.	32 12 28	2322	30 27 1	2343	28 42 5	2365	26 57 40	2387
	Regulus	E.	68 24 40	2317	66 39 6	2336	64 54 0	2355	63 9 21	2374
	Jupiter	E.	103 54 53	2370	102 10 35	2389	100 26 44	2407	98 43 19	2426

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S					Sidereal Time of Semi-diameter Passing Meridian.	Equation of Time, to be Subtracted from Apparent Time.	Diff. for 1 Hour.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Semi-diameter			
		h m s	s	° ′ ″	″	′ ″	s	m s	s
Mon.	1	14 24 9.69	9.780	S. 14 19 6.1	−48.31	16 9.13	66.86	16 19.26	0.076
Tues.	2	14 28 4.83	9.815	14 38 18.5	47.72	16 9.38	66.97	16 20.68	0.041
Wed.	3	14 32 0.79	9.849	14 57 16.8	47.12	16 9.62	67.09	16 21.27	0.007
Thur.	4	14 35 57.58	9.884	15 16 0.6	−46.51	16 9.86	67.21	16 21.04	0.028
Frid.	5	14 39 55.20	9.919	15 34 29.6	45.89	16 10.09	67.33	16 19.97	0.063
Sat.	6	14 43 53.67	9.954	15 52 43.4	45.24	16 10.33	67.44	16 18.06	0.098
SUN.	7	14 47 53.00	9.989	16 10 41.3	−44.58	16 10.56	67.56	16 15.30	0.133
Mon.	8	14 51 53.19	10.025	16 28 23.0	43.90	16 10.79	67.68	16 11.68	0.169
Tues.	9	14 55 54.23	10.061	16 45 48.2	43.20	16 11.02	67.80	16 7.20	0.204
Wed.	10	14 59 56.12	10.097	17 2 56.5	−42.48	16 11.25	67.92	16 1.87	0.240
Thur.	11	15 3 58.88	10.133	17 19 47.3	41.74	16 11.47	68.04	15 55.69	0.276
Frid.	12	15 8 2.50	10.169	17 36 20.2	40.99	16 11.69	68.16	15 48.65	0.312
Sat.	13	15 12 6.98	10.204	17 52 34.9	−40.22	16 11.91	68.28	15 40.75	0.347
SUN.	14	15 16 12.30	10.240	18 8 30.9	39.44	16 12.13	68.40	15 32.01	0.382
Mon.	15	15 20 18.47	10.275	18 24 7.9	38.63	16 12.34	68.52	15 22.42	0.417
Tues.	16	15 24 25.48	10.310	18 39 25.4	−37.81	16 12.56	68.64	15 12.00	0.452
Wed.	17	15 28 33.32	10.344	18 54 22.9	36.97	16 12.77	68.75	15 0.75	0.486
Thur.	18	15 32 41.98	10.378	19 9 0.1	36.12	16 12.98	68.87	14 48.68	0.520
Frid.	19	15 36 51.46	10.412	19 23 16.7	−35.25	16 13.19	68.98	14 35.79	0.554
Sat.	20	15 41 1.74	10.445	19 37 12.3	34.36	16 13.39	69.09	14 22.10	0.587
SUN.	21	15 45 12.82	10.478	19 50 46.4	33.46	16 13.59	69.20	14 7.62	0.620
Mon.	22	15 49 24.69	10.511	20 3 58.6	−32.55	16 13.79	69.31	13 52.35	0.653
Tues.	23	15 53 37.35	10.543	20 16 48.7	31.62	16 13.98	69.42	13 36.29	0.685
Wed.	24	15 57 50.77	10.575	20 29 16.4	30.68	16 14.17	69.53	13 19.47	0.717
Thur.	25	16 2 4.95	10.606	20 41 21.2	−29.72	16 14.36	69.64	13 1.89	0.748
Frid.	26	16 6 19.88	10.637	20 53 2.8	28.75	16 14.54	69.75	12 43.57	0.779
Sat.	27	16 10 35.55	10.668	21 4 21.0	27.76	16 14.71	69.85	12 24.51	0.809
SUN.	28	16 14 51.94	10.698	21 15 15.5	−26.77	16 14.87	69.95	12 4.73	0.839
Mon.	29	16 19 9.05	10.728	21 25 45.9	25.76	16 15.03	70.04	11 44.24	0.869
Tues.	30	16 23 26.87	10.757	21 35 51.9	24.74	16 15.19	70.13	11 23.04	0.898
Wed.	31	16 27 45.37	10.785	S. 21 45 33.4	−23.71	16 15.34	70.22	11 1.15	0.926

Note.—The mean time of semidiameter passing the meridian may be found by subtracting 0ˢ.19 from the sidereal time. The sign − prefixed to the hourly change of declination indicates that south declinations are increasing.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Equation of Time, to be Added to Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		h m s	s	° ′ ″	″	m s	s	h m s
Mon.	1	14 24 12.36	9.781	S. 14 19 19.2	−48.29	16 19.28	0.076	14 40 31.63
Tues.	2	14 28 7.50	9.815	14 38 31.4	47.71	16 20.69	0.041	14 44 28.19
Wed.	3	14 32 3.47	9.849	14 57 29.5	47.12	16 21.27	0.007	14 48 24.74
Thur.	4	14 36 0.27	9.884	15 16 13.3	−46.51	16 21.02	0.028	14 52 21.30
Frid.	5	14 39 57.91	9.919	15 34 42.3	45.87	16 19.94	0.063	14 56 17.85
Sat.	6	14 43 56.39	9.954	15 52 55.8	45.22	16 18.02	0.098	15 0 14.41
SUN.	7	14 47 55.72	9.990	16 10 53.4	−44.56	16 15.25	0.133	15 4 10.97
Mon.	8	14 51 55.90	10.026	16 28 34.9	43.88	16 11.62	0.169	15 8 7.52
Tues.	9	14 55 56.93	10.062	16 45 59.9	43.18	16 7.14	0.204	15 12 4.08
Wed.	10	14 59 58.82	10.097	17 3 7.9	−42.46	16 1.81	0.240	15 16 0.63
Thur.	11	15 4 1.57	10.133	17 19 58.4	41.73	15 55.62	0.276	15 19 57.19
Frid.	12	15 8 5.18	10.168	17 36 31.0	40.98	15 48.57	0.312	15 23 53.75
Sat.	13	15 12 9.64	10.204	17 52 45.4	−40.21	15 40.66	0.347	15 27 50.30
SUN.	14	15 16 14.95	10.239	18 8 41.1	39.42	15 31.91	0.382	15 31 46.86
Mon.	15	15 20 21.10	10.274	18 24 17.8	38.62	15 22.32	0.417	15 35 43.42
Tues.	16	15 24 28.09	10.309	18 39 35.0	−37.80	15 11.89	0.452	15 39 39.98
Wed.	17	15 28 35.90	10.343	18 54 32.2	36.96	15 0.63	0.486	15 43 36.53
Thur.	18	15 32 44.54	10.377	19 9 9.1	36.10	14 48.55	0.520	15 47 33.09
Frid.	19	15 36 53.99	10.411	19 23 25.4	−35.23	14 35.66	0.554	15 51 29.64
Sat.	20	15 41 4.24	10.444	19 37 20.6	34.35	14 21.96	0.587	15 55 26.20
SUN.	21	15 45 15.29	10.477	19 50 54.3	33.44	14 7.46	0.620	15 59 22.76
Mon.	22	15 49 27.13	10.510	20 4 6.2	−32.52	13 52.18	0.653	16 3 19.31
Tues.	23	15 53 39.74	10.542	20 16 55.9	31.59	13 36.13	0.685	16 7 15.87
Wed.	24	15 57 53.11	10.573	20 29 23.2	30.65	13 19.31	0.717	16 11 12.43
Thur.	25	16 2 7.25	10.604	20 41 27.6	−29.70	13 1.73	0.748	16 15 8.98
Frid.	26	16 6 22.13	10.635	20 53 8.9	28.73	12 43.41	0.779	16 19 5.54
Sat.	27	16 10 37.75	10.666	21 4 26.8	27.75	12 24.35	0.809	16 23 2.10
SUN.	28	16 14 54.09	10.696	21 15 20.9	−26.75	12 4.57	0.839	16 26 58.66
Mon.	29	16 19 11.15	10.726	21 25 50.9	25.74	11 44.07	0.869	16 30 55.22
Tues.	30	16 23 28.91	10.755	21 35 56.6	24.72	11 22.87	0.898	16 34 51.78
Wed.	31	16 27 47.35	10.783	S. 21 45 37.7	−23.69	11 0.98	0.926	16 38 48.33

Note.—The semidiameter for mean noon may be assumed the same as that for apparent noon. The sign − prefixed to the hourly change of declination indicates that south declinations are increasing.

Diff. for 1 Hour, + 9s.8565. (Table III.)

AT GREENWICH MEAN NOON.								
		THE SUN'S						
Day of the Month.	Day of the Year.	TRUE LONGITUDE. λ	TRUE LONGITUDE. λ′	Diff. for 1 Hour.	LATITUDE.	Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.
		° ′ ″	′ ″	″	″			h m s
1	305	218 26 11.0	25 46.4	150.13	— 0.04	9.996 5666	- 45.9	9 17 56.71
2	306	219 26 15.2	25 50.5	150.22	+ 0.07	9.996 4573	45.3	9 14 0.80
3	307	220 26 21.6	25 56.7	150.31	0.19	9.996 3493	44.7	9 10 4.89
4	308	221 26 30.2	26 5.2	150.40	+ 0.27	9.996 2425	- 44.2	9 6 8.98
5	309	222 26 40.8	26 15.6	150.49	0.31	9.996 1368	43.8	9 2 13.07
6	310	223 26 53.4	26 28.2	150.57	0.34	9.996 0322	43.4	8 58 17.16
7	311	224 27 8.1	26 42.7	150.66	+ 0.35	9.995 9286	- 43.0	8 54 21.25
8	312	225 27 24.8	26 59.3	150.74	0.32	9.995 8259	42.6	8 50 25.34
9	313	226 27 43.5	27 17.8	150.82	0.26	9.995 7240	42.3	8 46 29.43
10	314	227 28 4.0	27 38.2	150.89	+ 0.18	9.995 6229	- 42.0	8 42 33.52
11	315	228 28 26.4	28 0.4	150.97	+ 0.09	9.995 5227	41.6	8 38 37.61
12	316	229 28 50.5	28 24.3	151.04	— 0.02	9.995 4232	41.2	8 34 41.70
13	317	230 29 16.3	28 50.0	151.11	— 0.15	9.995 3246	- 40.9	8 30 45.79
14	318	231 29 43.8	29 17.3	151.17	0.29	9.995 2269	40.6	8 26 49.88
15	319	232 30 12.7	29 46.1	151.24	0.44	9.995 1300	40.2	8 22 53.97
16	320	233 30 43.2	30 16.4	151.30	— 0.58	9.995 0340	- 39.8	8 18 58.06
17	321	234 31 15.0	30 48.0	151.36	0.69	9.994 9391	39.3	8 15 2.15
18	322	235 31 48.1	31 21.0	151.41	0.78	9.994 8452	38.8	8 11 6.24
19	323	236 32 22.5	31 55.2	151.46	— 0.84	9.994 7526	- 38.3	8 7 10.33
20	324	237 32 58.1	32 30.6	151.51	0.89	9.994 6614	37.7	8 3 14.42
21	325	238 33 34.8	33 7.2	151.56	0.91	9.994 5718	37.0	7 59 18.51
22	326	239 34 12.7	33 44.9	151.60	— 0.90	9.994 4839	- 36.2	7 55 22.60
23	327	240 34 51.7	34 23.7	151.64	0.86	9.994 3980	35.4	7 51 26.68
24	328	241 35 31.8	35 3.7	151.69	0.79	9.994 3141	34.5	7 47 30.77
25	329	242 36 13.1	35 44.8	151.74	— 0.68	9.994 2324	- 33.5	7 43 34.86
26	330	243 36 55.5	36 27.1	151.79	0.53	9.994 1530	32.5	7 39 38.95
27	331	244 37 39.2	37 10.6	151.84	0.37	9.994 0762	31.5	7 35 43.04
28	332	245 38 24.2	37 55.4	151.90	— 0.23	9.994 0018	- 30.5	7 31 47.12
29	333	246 39 10.4	38 41.4	151.95	— 0.11	9.993 9298	29.5	7 27 51.21
30	334	247 39 58.0	39 28.9	152.01	+ 0.01	9.993 8602	28.5	7 23 55.30
31	335	248 40 47.1	40 17.8	152.07	+ 0.10	9.993 7930	- 27.5	7 19 59.39

NOTE.—The numbers in column λ correspond to the true equinox of the date; in column λ′ to the mean equinox of January $0^d.0$.

Diff. for 1 Hour, — $9^s.8296$. (Table II.)

GREENWICH MEAN TIME.

THE MOON'S

Day of the Month.	SEMIDIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
	′ ″	′ ″	′ ″	″	′ ″	″	h m	m	d
1	16 1.7	15 53.7	58 43.4	– 2.40	58 14.2	– 2.43	15 44.2	2.45	18.2
2	15 45.8	15 38.0	57 45.0	2.41	57 16.3	2.34	16 41.7	2.34	19.2
3	15 30.5	15 23.4	56 48.8	2.23	56 22.7	2.10	17 36.0	2.18	20.2
4	15 16.8	15 10.7	55 58.4	– 1.94	55 36.2	– 1.76	18 26.3	2.01	21.2
5	15 5.2	15 0.4	55 16.2	1.57	54 58.5	1.38	19 12.8	1.87	22.2
6	14 56.3	14 52.8	54 43.2	1.18	54 30.3	0.98	19 56.2	1.76	23.2
7	14 49.9	14 47.7	54 19.9	– 0.78	54 12.0	– 0.59	20 37.4	1.68	24.2
8	14 46.1	14 45.0	54 5.4	0.41	54 1.8	– 0.24	21 17.4	1.65	25.2
9	14 44.5	14 44.5	54 0.1	– 0.08	54 0.1	+ 0.08	21 57.1	1.66	26.2
10	14 45.0	14 45.9	54 1.8	+ 0.21	54 5.1	+ 0.33	22 37.5	1.71	27.2
11	14 47.2	14 48.9	54 9.8	0.45	54 15.9	0.56	23 19.5	1.80	28.2
12	14 50.8	14 53.1	54 23.2	0.65	54 31.5	0.74	6	. . .	29.2
13	14 55.6	14 58.4	54 40.9	+ 0.82	54 51.1	+ 0.89	0 3.9	1.91	0.4
14	15 1.5	15 4.7	55 2.3	0.96	55 14.3	1.03	0 51.2	2.04	1.4
15	15 8.2	15 11.9	55 27.1	1.10	55 40.7	1.17	1 41.7	2.17	2.4
16	15 15.9	15 20.0	55 55.1	+ 1.24	56 10.4	+ 1.30	2 34.9	2.26	3.4
17	15 24.4	15 29.0	56 26.5	1.38	56 43.4	1.44	3 29.8	2.31	4.4
18	15 33.9	15 38.9	57 1.2	1.51	57 19.6	1.57	4 25.1	2.29	5.4
19	15 44.1	15 49.4	57 38.8	+ 1.61	57 58.4	+ 1.64	5 19.6	2.24	6.4
20	15 54.8	16 0.3	58 18.4	1.67	58 38.5	1.67	6 12.5	2.17	7.4
21	16 5.7	16 11.0	58 58.3	1.63	59 17.6	1.56	7 3.8	2.11	8.4
22	16 16.0	16 20.6	59 35.9	+ 1.46	59 52.7	+ 1.32	7 54.1	2.09	9.4
23	16 24.6	16 28.0	60 7.5	1.13	60 19.9	0.91	8 44.4	2.11	10.4
24	16 30.5	16 32.2	60 29.3	0.65	60 35.4	+ 0.36	9 35.8	2.18	11.4
25	16 32.8	16 32.4	60 37.8	+ 0.04	60 36.2	– 0.30	10 29.3	2.29	12.4
26	16 30.9	16 28.2	60 30.6	– 0.63	60 20.9	0.96	11 25.7	2.41	13.4
27	16 24.6	16 20.0	60 7.5	1.27	59 50.5	1.55	12 24.8	2.51	14.4
28	16 14.5	16 8.3	59 30.5	– 1.78	59 7.8	– 1.97	13 25.6	2.54	15.4
29	16 1.7	15 54.6	58 43.3	2.10	58 17.3	2.20	14 25.9	2.47	16.4
30	15 47.3	15 40.0	57 50.6	2.23	57 23.7	2.23	15 23.6	2.33	17.4
31	15 32.7	15 25.8	56 57.1	2.17	56 31.5	2.08	16 17.3	2.15	18.4
32	15 19.2	15 13.0	56 7.2	– 1.96	55 44.6	– 1.80	17 6.6	1.97	19.4

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

MONDAY 1.

Hour.	Right Ascension.			Diff. for 1 Minute.	Declination.			Diff. for 1 Minute.
	h	m	s	s	°	′	″	″
0	5	47	24.42	2.5487	N.25	9	55.0	3.749
1	5	49	57.31	2.5476	25	13	34.9	3.580
2	5	52	30.13	2.5462	25	17	4.6	3.411
3	5	55	2.86	2.5448	25	20	24.2	3.242
4	5	57	35.51	2.5434	25	23	33.7	3.074
5	6	0	8.07	2.5418	25	26	33.1	2.906
6	6	2	40.53	2.5401	25	29	22.4	2.737
7	6	5	12.88	2.5382	25	32	1.6	2.570
8	6	7	45.11	2.5362	25	34	30.8	2.402
9	6	10	17.22	2.5342	25	36	50.0	2.236
10	6	12	49.21	2.5320	25	38	59.1	2.069
11	6	15	21.06	2.5296	25	40	58.2	1.902
12	6	17	52.76	2.5272	25	42	47.3	1.736
13	6	20	24.32	2.5247	25	44	26.5	1.570
14	6	22	55.72	2.5220	25	45	55.7	1.404
15	6	25	26.96	2.5192	25	47	15.0	1.240
16	6	27	58.02	2.5162	25	48	24.5	1.077
17	6	30	28.91	2.5133	25	49	24.2	0.913
18	6	32	59.62	2.5102	25	50	14.1	0.750
19	6	35	30.14	2.5070	25	50	54.2	0.587
20	6	38	0.46	2.5037	25	51	24.6	0.426
21	6	40	30.58	2.5002	25	51	45.3	0.265
22	6	43	0.49	2.4967	25	51	56.3	+0.104
23	6	45	30.19	2.4931	N.25	51	57.7	−0.056

TUESDAY 2.

Hour.	Right Ascension.			Diff. for 1 Minute.	Declination.			Diff. for 1 Minute.
0	6	47	59.66	2.4893	N.25	51	49.6	0.215
1	6	50	28.91	2.4855	25	51	32.0	0.373
2	6	52	57.92	2.4815	25	51	4.9	0.531
3	6	55	26.69	2.4775	25	50	28.3	0.687
4	6	57	55.22	2.4734	25	49	42.4	0.843
5	7	0	23.50	2.4692	25	48	47.1	0.999
6	7	2	51.52	2.4647	25	47	42.5	1.154
7	7	5	19.27	2.4603	25	46	28.6	1.307
8	7	7	46.76	2.4559	25	45	5.6	1.459
9	7	10	13.98	2.4513	25	43	33.5	1.612
10	7	12	40.92	2.4467	25	41	52.2	1.763
11	7	15	7.58	2.4419	25	40	1.9	1.912
12	7	17	33.95	2.4371	25	38	2.7	2.062
13	7	20	0.03	2.4322	25	35	54.5	2.210
14	7	22	25.81	2.4272	25	33	37.5	2.357
15	7	24	51.29	2.4221	25	31	11.7	2.503
16	7	27	16.46	2.4169	25	28	37.1	2.649
17	7	29	41.32	2.4117	25	25	53.8	2.793
18	7	32	5.87	2.4065	25	23	1.9	2.936
19	7	34	30.10	2.4012	25	20	1.5	3.078
20	7	36	54.01	2.3957	25	16	52.6	3.218
21	7	39	17.59	2.3903	25	13	35.3	3.359
22	7	41	40.85	2.3848	25	10	9.6	3.498
23	7	44	3.77	2.3792	25	6	35.5	3.636
24	7	46	26.35	2.3735	N.25	2	53.2	3.772

WEDNESDAY 3.

Hour.	Right Ascension.			Diff. for 1 Minute.	Declination.			Diff. for 1 Minute.
	h	m	s	s	°	′	″	″
0	7	46	26.35	2.3735	N.25	2	53.2	3.772
1	7	48	48.59	2.3678	24	59	2.8	3.908
2	7	51	10.49	2.3622	24	55	4.2	4.043
3	7	53	32.05	2.3564	24	50	57.6	4.177
4	7	55	53.26	2.3505	24	46	43.0	4.308
5	7	58	14.11	2.3446	24	42	20.6	4.439
6	8	0	34.61	2.3387	24	37	50.3	4.570
7	8	2	54.76	2.3328	24	33	12.2	4.699
8	8	5	14.55	2.3268	24	28	26.4	4.827
9	8	7	33.98	2.3207	24	23	33.0	4.953
10	8	9	53.04	2.3147	24	18	32.0	5.079
11	8	12	11.74	2.3087	24	13	23.5	5.204
12	8	14	30.08	2.3026	24	8	7.5	5.327
13	8	16	48.05	2.2964	24	2	44.2	5.448
14	8	19	5.65	2.2902	23	57	13.7	5.569
15	8	21	22.87	2.2840	23	51	35.9	5.689
16	8	23	39.72	2.2778	23	45	51.0	5.807
17	8	25	56.20	2.2716	23	39	59.0	5.925
18	8	28	12.31	2.2653	23	34	0.0	6.042
19	8	30	28.04	2.2591	23	27	54.0	6.157
20	8	32	43.40	2.2528	23	21	41.2	6.271
21	8	34	58.38	2.2465	23	15	21.5	6.384
22	8	37	12.98	2.2402	23	8	55.1	6.495
23	8	39	27.21	2.2340	N.23	2	22.1	6.605

THURSDAY 4.

Hour.	Right Ascension.			Diff. for 1 Minute.	Declination.			Diff. for 1 Minute.
0	8	41	41.06	2.2277	N.22	55	42.5	6.714
1	8	43	54.53	2.2214	22	48	56.4	6.822
2	8	46	7.63	2.2152	22	42	3.8	6.929
3	8	48	20.35	2.2088	22	35	4.9	7.035
4	8	50	32.69	2.2026	22	27	59.6	7.140
5	8	52	44.66	2.1963	22	20	48.1	7.243
6	8	54	56.25	2.1900	22	13	30.4	7.346
7	8	57	7.46	2.1837	22	6	6.6	7.447
8	8	59	18.30	2.1775	21	58	36.8	7.547
9	9	1	28.76	2.1712	21	51	1.0	7.646
10	9	3	38.85	2.1651	21	43	19.3	7.744
11	9	5	48.57	2.1588	21	35	31.7	7.841
12	9	7	57.91	2.1526	21	27	38.4	7.936
13	9	10	6.88	2.1465	21	19	39.4	8.030
14	9	12	15.48	2.1403	21	11	34.8	8.123
15	9	14	23.72	2.1342	21	3	24.6	8.216
16	9	16	31.59	2.1282	20	55	8.9	8.307
17	9	18	39.10	2.1221	20	46	47.8	8.396
18	9	20	46.24	2.1160	20	38	21.4	8.485
19	9	22	53.02	2.1100	20	29	49.6	8.573
20	9	24	59.44	2.1040	20	21	12.6	8.659
21	9	27	5.50	2.0980	20	12	30.5	8.745
22	9	29	11.20	2.0921	20	3	43.2	8.830
23	9	31	16.55	2.0862	19	54	50.9	8.913
24	9	33	21.55	2.0804	N.19	45	53.6	8.996

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	FRIDAY 5.					**SUNDAY 7.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	9 33 21.55	2.0804	N.19 45 53.6	8.996	0	11 7 20.03	1.8559	N.11 17 50.4	11.829
1	9 35 26.20	2.0745	19 36 51.4	9.077	1	11 9 11.29	1.8527	11 5 59.5	11.867
2	9 37 30.49	2.0687	19 27 44.4	9.157	2	11 11 2.35	1.8494	10 54 6.4	11.904
3	9 39 34.44	2.0630	19 18 32.6	9.236	3	11 12 53.22	1.8463	10 42 11.0	11.942
4	9 41 38.05	2.0573	19 9 16.1	9.313	4	11 14 43.91	1.8432	10 30 13.4	11.977
5	9 43 41.32	2.0517	18 59 55.0	9.391	5	11 16 34.41	1.8402	10 18 13.7	12.012
6	9 45 44.25	2.0460	18 50 29.2	9.467	6	11 18 24.74	1.8373	10 6 11.9	12.047
7	9 47 46.84	2.0404	18 40 58.9	9.542	7	11 20 14.89	1.8343	9 54 8.0	12.082
8	9 49 49.10	2.0348	18 31 24.1	9.617	8	11 22 4.86	1.8315	9 42 2.1	12.114
9	9 51 51.02	2.0293	18 21 44.9	9.690	9	11 23 54.67	1.8288	9 29 54.3	12.147
10	9 53 52.62	2.0239	18 12 1.3	9.762	10	11 25 44.32	1.8262	9 17 44.5	12.178
11	9 55 53.89	2.0185	18 2 13.5	9.832	11	11 27 33.81	1.8235	9 5 32.9	12.209
12	9 57 54.84	2.0132	17 52 21.4	9.903	12	11 29 23.14	1.8209	8 53 19.4	12.240
13	9 59 55.47	2.0078	17 42 25.1	9.972	13	11 31 12.32	1.8184	8 41 4.1	12.269
14	10 1 55.78	2.0025	17 32 24.7	10.040	14	11 33 1.35	1.8160	8 28 47.1	12.297
15	10 3 55.77	1.9972	17 22 20.3	10.107	15	11 34 50.24	1.8137	8 16 28.4	12.326
16	10 5 55.45	1.9921	17 12 11.9	10.173	16	11 36 38.99	1.8113	8 4 8.0	12.353
17	10 7 54.82	1.9870	17 1 59.5	10.239	17	11 38 27.60	1.8090	7 51 46.0	12.380
18	10 9 53.89	1.9820	16 51 43.2	10.303	18	11 40 16.07	1.8068	7 39 22.4	12.407
19	10 11 52.66	1.9769	16 41 23.1	10.367	19	11 42 4.42	1.8047	7 26 57.2	12.432
20	10 13 51.12	1.9719	16 30 59.2	10.430	20	11 43 52.64	1.8027	7 14 30.6	12.456
21	10 15 49.29	1.9670	16 20 31.5	10.492	21	11 45 40.74	1.8007	7 2 2.5	12.480
22	10 17 47.17	1.9622	16 10 0.2	10.552	22	11 47 28.73	1.7988	6 49 33.0	12.503
23	10 19 44.75	1.9573	N.15 59 25.3	10.611	23	11 49 16.60	1.7969	N. 6 37 2.1	12.526
	SATURDAY 6.					**MONDAY 8.**			
0	10 21 42.04	1.9525	N.15 48 46.9	10.670	0	11 51 4.36	1.7952	N. 6 24 29.9	12.547
1	10 23 39.05	1.9479	15 38 4.9	10.728	1	11 52 52.02	1.7935	6 11 56.4	12.568
2	10 25 35.79	1.9432	15 27 19.5	10.785	2	11 54 39.58	1.7918	5 59 21.7	12.589
3	10 27 32.24	1.9386	15 16 30.7	10.842	3	11 56 27.04	1.7902	5 46 45.7	12.609
4	10 29 28.42	1.9342	15 5 38.5	10.897	4	11 58 14.40	1.7886	5 34 8.6	12.627
5	10 31 24.33	1.9297	14 54 43.1	10.951	5	12 0 1.67	1.7872	5 21 30.4	12.646
6	10 33 19.98	1.9252	14 43 44.4	11.005	6	12 1 48.86	1.7858	5 8 51.1	12.664
7	10 35 15.36	1.9208	14 32 42.5	11.058	7	12 3 35.97	1.7844	4 56 10.7	12.682
8	10 37 10.48	1.9166	14 21 37.4	11.110	8	12 5 22.99	1.7831	4 43 29.3	12.698
9	10 39 5.35	1.9123	14 10 29.3	11.161	9	12 7 9.94	1.7819	4 30 46.9	12.714
10	10 40 59.96	1.9082	13 59 18.1	11.211	10	12 8 56.82	1.7808	4 18 3.6	12.728
11	10 42 54.33	1.9041	13 48 4.0	11.260	11	12 10 43.64	1.7797	4 5 19.5	12.742
12	10 44 48.45	1.9000	13 36 46.9	11.309	12	12 12 30.39	1.7787	3 52 34.5	12.757
13	10 46 42.33	1.8960	13 25 26.9	11.357	13	12 14 17.08	1.7777	3 39 48.7	12.770
14	10 48 35.97	1.8920	13 14 4.1	11.403	14	12 16 3.72	1.7768	3 27 2.1	12.782
15	10 50 29.37	1.8881	13 2 38.5	11.450	15	12 17 50.30	1.7760	3 14 14.8	12.793
16	10 52 22.54	1.8842	12 51 10.1	11.495	16	12 19 36.84	1.7752	3 1 26.9	12.804
17	10 54 15.48	1.8805	12 39 39.1	11.539	17	12 21 23.33	1.7745	2 48 38.3	12.816
18	10 56 8.20	1.8768	12 28 5.4	11.583	18	12 23 9.78	1.7738	2 35 49.0	12.826
19	10 58 0.70	1.8732	12 16 29.1	11.626	19	12 24 56.19	1.7732	2 22 59.2	12.834
20	10 59 52.99	1.8697	12 4 50.3	11.667	20	12 26 42.57	1.7727	2 10 8.9	12.842
21	11 1 45.06	1.8661	11 53 9.0	11.709	21	12 28 28.92	1.7723	1 57 18.1	12.850
22	11 3 36.92	1.8627	11 41 25.2	11.750	22	12 30 15.25	1.7720	1 44 26.9	12.857
23	11 5 28.58	1.8592	11 29 39.0	11.790	23	12 32 1.56	1.7717	1 31 35.2	12.864
24	11 7 20.03	1.8559	N.11 17 50.4	11.829	24	12 33 47.85	1.7714	N. 1 18 43.2	12.870

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

TUESDAY 9.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	12 33 47.85	1.7714	N. 1 18 43.2	12.870
1	12 35 34.13	1.7712	1 5 50.8	12.875
2	12 37 20.39	1.7710	0 52 58.2	12.879
3	12 39 6 65	1.7710	0 40 5.3	12.883
4	12 40 52.91	1.7710	0 27 12.2	12.886
5	12 42 39.17	1.7710	0 14 19.0	12.888
6	12 44 25.43	1.7711	N. 0 1 25.6	12.891
7	12 46 11.70	1.7713	S. 0 11 27.9	12.892
8	12 47 57.99	1.7716	0 24 21.4	12.892
9	12 49 44.29	1.7718	0 37 14.9	12.891
10	12 51 30.61	1.7722	0 50 8.3	12.890
11	12 53 16.96	1.7727	1 3 1.7	12.888
12	12 55 3.33	1.7732	1 15 54.9	12.886
13	12 56 49.74	1.7737	1 28 48.0	12.883
14	12 58 36.18	1.7743	1 41 40.9	12.879
15	13 0 22.66	1.7750	1 54 33.5	12.874
16	13 2 9.18	1.7757	2 7 25.8	12.869
17	13 3 55.75	1.7766	2 20 17.8	12.864
18	13 5 42.37	1.7775	2 33 9.5	12.857
19	13 7 29.05	1.7784	2 46 0.7	12.850
20	13 9 15.78	1.7793	2 58 51.5	12.842
21	13 11 2.57	1.7803	3 11 41.8	12.834
22	13 12 49.42	1.7814	3 24 31.6	12.825
23	13 14 36.34	1.7827	S. 3 37 20.8	12.814

WEDNESDAY 10.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	13 16 23.34	1.7839	S. 3 50 9.3	12.803
1	13 18 10.41	1.7852	4 2 57.2	12.792
2	13 19 57.56	1.7865	4 15 44.4	12.780
3	13 21 44.79	1.7879	4 28 30.8	12.767
4	13 23 32.11	1.7894	4 41 16.4	12.753
5	13 25 19.52	1.7909	4 54 1.2	12.739
6	13 27 7.02	1.7925	5 6 45.1	12.724
7	13 28 54.62	1.7942	5 19 28.1	12.708
8	13 30 42.32	1.7959	5 32 10.1	12.692
9	13 32 30.13	1.7977	5 44 51.1	12.675
10	13 34 18.04	1.7994	5 57 31.1	12.657
11	13 36 6.06	1.8013	6 10 9.9	12.637
12	13 37 54.20	1.8032	6 22 47.6	12.618
13	13 39 42.45	1.8052	6 35 24.1	12.598
14	13 41 30.83	1.8074	6 47 59.4	12.577
15	13 43 19.34	1.8095	7 0 33.3	12.555
16	13 45 7.97	1.8117	7 13 6.0	12.533
17	13 46 56.74	1.8139	7 25 37.3	12.509
18	13 48 45.64	1.8162	7 38 7.1	12.485
19	13 50 34.68	1.8185	7 50 35.5	12.461
20	13 52 23.86	1.8209	8 3 2.4	12.435
21	13 54 13.19	1.8233	8 15 27.7	12.408
22	13 56 2.66	1.8258	8 27 51.4	12.381
23	13 57 52.29	1.8285	8 40 13.4	12.352
24	13 59 42.08	1.8311	S. 8 52 33.7	12.324

THURSDAY 11.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	13 59 42.08	1.8311	S. 8 52 33.7	12.324
1	14 1 32.02	1.8338	9 4 52.3	12.295
2	14 3 22.13	1.8366	9 17 9.1	12.264
3	14 5 12.41	1.8393	9 29 24.0	12.232
4	14 7 2.85	1.8422	9 41 37.0	12.201
5	14 8 53.47	1.8451	9 53 48.1	12.168
6	14 10 44.26	1.8480	10 5 57.2	12.134
7	14 12 35.23	1.8510	10 18 4.2	12.100
8	14 14 26.38	1.8541	10 30 9.2	12.065
9	14 16 17.72	1.8572	10 42 12.0	12.028
10	14 18 9.24	1.8603	10 54 12.6	11.991
11	14 20 0.96	1.8636	11 6 10.9	11.953
12	14 21 52.87	1.8668	11 18 7.0	11.915
13	14 23 44.98	1.8701	11 30 0.7	11.875
14	14 25 37.28	1.8734	11 41 52.0	11.835
15	14 27 29.79	1.8769	11 53 40.9	11.794
16	14 29 22.51	1.8804	12 5 27.3	11.752
17	14 31 15.44	1.8839	12 17 11.1	11.708
18	14 33 8.58	1.8874	12 28 52.3	11.664
19	14 35 1.93	1.8910	12 40 30.8	11.619
20	14 36 55.50	1.8947	12 52 6.6	11.573
21	14 38 49.30	1.8985	13 3 39.6	11.527
22	14 40 43.32	1.9022	13 15 9.8	11.480
23	14 42 37.57	1.9060	S. 13 26 37.2	11.432

FRIDAY 12.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	14 44 32.04	1.9098	S. 13 38 1.6	11.382
1	14 46 26.75	1.9137	13 49 23.0	11.332
2	14 48 21.69	1.9177	14 0 41.4	11.281
3	14 50 16.87	1.9217	14 11 56.7	11.229
4	14 52 12.30	1.9257	14 23 8.9	11.176
5	14 54 7.96	1.9297	14 34 17.8	11.122
6	14 56 3.87	1.9339	14 45 23.5	11.067
7	14 58 0.03	1.9380	14 56 25.8	11.011
8	14 59 56.43	1.9422	15 7 24.8	10.955
9	15 1 53.09	1.9464	15 18 20.4	10.897
10	15 3 50.00	1.9507	15 29 12.4	10.837
11	15 5 47.17	1.9550	15 40 0.9	10.778
12	15 7 44.60	1.9593	15 50 45.8	10.717
13	15 9 42.29	1.9637	16 1 27.0	10.657
14	15 11 40.24	1.9681	16 12 4.6	10.595
15	15 13 38.46	1.9726	16 22 38.4	10.531
16	15 15 36.95	1.9770	16 33 8.3	10.467
17	15 17 35.70	1.9815	16 43 34.4	10.402
18	15 19 34.73	1.9861	16 53 56.5	10.335
19	15 21 34.03	1.9907	17 4 14.6	10.267
20	15 23 33.61	1.9952	17 14 28.6	10.199
21	15 25 33.46	1.9998	17 24 38.5	10.130
22	15 27 33.59	2.0045	17 34 44.2	10.060
23	15 29 34.00	2.0092	17 44 45.7	9.988
24	15 31 34.69	2.0139	S. 17 54 42.8	9.916

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	SATURDAY 13.					MONDAY 15.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	15 31 34.69	2.0139	S. 17 54 42.8	9.916	0	17 13 53.47	2.2467	S. 24 8 19.3	5.268
1	15 33 35.67	2.0187	18 4 35.6	9.843	1	17 16 8.41	2.2512	24 13 31.8	5.147
2	15 35 36.93	2.0234	18 14 24.0	9.769	2	17 18 23.61	2.2555	24 18 37.0	5.026
3	15 37 38.48	2.0282	18 24 7.9	9.693	3	17 20 39.07	2.2597	24 23 34.9	4.904
4	15 39 40.32	2.0331	18 33 47.2	9.617	4	17 22 54.78	2.2640	24 28 25.5	4.781
5	15 41 42.45	2.0379	18 43 21.9	9.540	5	17 25 10.75	2.2682	24 33 8.6	4.657
6	15 43 44.87	2.0427	18 52 52.0	9.462	6	17 27 26.97	2.2724	24 37 44.3	4.532
7	15 45 47.58	2.0476	19 2 17.4	9.383	7	17 29 43.44	2.2765	24 42 12.5	4.407
8	15 47 50.58	2.0524	19 11 38.0	9.302	8	17 32 0.15	2.2805	24 46 33.1	4.280
9	15 49 53.87	2.0573	19 20 53.7	9.221	9	17 34 17.10	2.2845	24 50 46.1	4.153
10	15 51 57.46	2.0623	19 30 4.5	9.138	10	17 36 34.29	2.2884	24 54 51.5	4.025
11	15 54 1.35	2.0672	19 39 10.3	9.055	11	17 38 51.71	2.2922	24 58 49.1	3.896
12	15 56 5.53	2.0722	19 48 11.1	8.971	12	17 41 9.36	2.2961	25 2 39.0	3.767
13	15 58 10.01	2.0772	19 57 6.8	8.886	13	17 43 27.24	2.2998	25 6 21.1	3.637
14	16 0 14.79	2.0821	20 5 57.4	8.799	14	17 45 45.34	2.3035	25 9 55.4	3.506
15	16 2 19.86	2.0871	20 14 42.7	8.712	15	17 48 3.66	2.3071	25 13 21.8	3.373
16	16 4 25.23	2.0921	20 23 22.8	8.623	16	17 50 22.19	2.3107	25 16 40.2	3.241
17	16 6 30.91	2.0971	20 31 57.5	8.533	17	17 52 40.94	2.3142	25 19 50.7	3.108
18	16 8 36.89	2.1021	20 40 26.8	8.443	18	17 54 59.89	2.3176	25 22 53.2	2.974
19	16 10 43.17	2.1071	20 48 50.7	8.352	19	17 57 19.05	2.3209	25 25 47.6	2.840
20	16 12 49.74	2.1121	20 57 9.1	8.260	20	17 59 38.40	2.3242	25 28 34.0	2.705
21	16 14 56.61	2.1171	21 5 21.9	8.167	21	18 1 57.95	2.3274	25 31 12.2	2.569
22	16 17 3.78	2.1221	21 13 29.1	8.072	22	18 4 17.69	2.3305	25 33 42.3	2.432
23	16 19 11.26	2.1270	S. 21 21 30.5	7.976	23	18 6 37.61	2.3335	S. 25 36 4.1	2.295
	SUNDAY 14.					TUESDAY 16.			
0	16 21 19.04	2.1321	S. 21 29 26.2	7.880	0	18 8 57.71	2.3365	S. 25 38 17.7	2.158
1	16 23 27.11	2.1371	21 37 16.1	7.782	1	18 11 17.99	2.3394	25 40 23.1	2.020
2	16 25 35.48	2.1420	21 45 0.1	7.683	2	18 13 38.44	2.3422	25 42 20.1	1.881
3	16 27 44.15	2.1470	21 52 38.1	7.584	3	18 15 59.05	2.3449	25 44 8.8	1.742
4	16 29 53.12	2.1520	22 0 10.2	7.484	4	18 18 19.83	2.3477	25 45 49.1	1.602
5	16 32 2.39	2.1569	22 7 36.2	7.382	5	18 20 40.77	2.3502	25 47 21.0	1.462
6	16 34 11.95	2.1618	22 14 56.0	7.279	6	18 23 1.86	2.3527	25 48 44.5	1.321
7	16 36 21.81	2.1668	22 22 9.7	7.176	7	18 25 23.09	2.3551	25 49 59.5	1.179
8	16 38 31.97	2.1717	22 29 17.1	7.071	8	18 27 44.47	2.3574	25 51 6.0	1.037
9	16 40 42.42	2.1766	22 36 18.2	6.966	9	18 30 5.99	2.3597	25 52 4.0	0.896
10	16 42 53.16	2.1815	22 43 13.0	6.859	10	18 32 27.64	2.3618	25 52 53.5	0.753
11	16 45 4.19	2.1863	22 50 1.3	6.752	11	18 34 49.41	2.3639	25 53 34.4	0.610
12	16 47 15.52	2.1912	22 56 43.2	6.643	12	18 37 11.30	2.3659	25 54 6.7	0.467
13	16 49 27.14	2.1960	23 3 18.5	6.533	13	18 39 33.31	2.3678	25 54 30.4	0.323
14	16 51 39.04	2.2007	23 9 47.2	6.423	14	18 41 55.44	2.3697	25 54 45.5	0.179
15	16 53 51.22	2.2054	23 16 9.3	6.312	15	18 44 17.67	2.3713	25 54 51.9	−0.034
16	16 56 3.69	2.2102	23 22 24.7	6.200	16	18 46 39.99	2.3729	25 54 49.6	+0.110
17	16 58 16.45	2.2150	23 28 33.3	6.087	17	18 49 2.42	2.3746	25 54 38.7	0.254
18	17 0 29.49	2.2196	23 34 35.1	5.972	18	18 51 24.94	2.3760	25 54 19.1	0.400
19	17 2 42.80	2.2242	23 40 30.0	5.857	19	18 53 47.54	2.3773	25 53 50.7	0.546
20	17 4 56.39	2.2287	23 46 17.9	5.741	20	18 56 10.22	2.3786	25 53 13.6	0.692
21	17 7 10.25	2.2333	23 51 58.9	5.624	21	18 58 32.97	2.3798	25 52 27.7	0.837
22	17 9 24.39	2.2379	23 57 32.8	5.506	22	19 0 55.80	2.3810	25 51 33.1	0.983
23	17 11 38.80	2.2423	24 2 59.6	5.387	23	19 3 18.69	2.3819	25 50 29.7	1.130
24	17 13 53.47	2.2467	S. 24 8 19.3	5.268	24	19 5 41.63	2.3828	S. 25 49 17.5	1.277

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
WEDNESDAY 17.					FRIDAY 19.				
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	19 5 41.63	2.3828	S. 25 49 17.5	1.277	0	20 59 34.86	2.3359	S. 22 1 0.6	8.111
1	19 8 4.63	2.3837	25 47 56.5	1.423	1	21 1 54.94	2.3335	21 52 50.0	8.242
2	19 10 27.67	2.3844	25 46 26.7	1.570	2	21 4 14.88	2.3311	21 44 31.6	8.372
3	19 12 50.76	2.3851	25 44 48.1	1.717	3	21 6 34.67	2.3287	21 36 5.4	8.502
4	19 15 13.88	2.3857	25 43 0.7	1.863	4	21 8 54.32	2.3262	21 27 31.4	8.631
5	19 17 37.04	2.3862	25 41 4.5	2.011	5	21 11 13.82	2.3237	21 18 49.7	8.759
6	19 20 0.22	2.3865	25 38 59.5	2.157	6	21 13 33.17	2.3212	21 10 0.3	8.886
7	19 22 23.42	2.3868	25 36 45.6	2.304	7	21 15 52.36	2.3187	21 1 3.4	9.012
8	19 24 46.64	2.3871	25 34 22.9	2.452	8	21 18 11.40	2.3160	20 51 58.9	9.137
9	19 27 9.87	2.3872	25 31 51.4	2.599	9	21 20 30.28	2.3134	20 42 46.9	9.262
10	19 29 33.10	2.3872	25 29 11.1	2.746	10	21 22 49.01	2.3108	20 33 27.4	9.387
11	19 31 56.34	2.3872	25 26 21.9	2.892	11	21 25 7.58	2.3082	20 24 0.5	9.510
12	19 34 19.57	2.3871	25 23 23.9	3.039	12	21 27 26.00	2.3057	20 14 26.2	9.632
13	19 36 42.79	2.3868	25 20 17.1	3.186	13	21 29 44.26	2.3030	20 4 44.6	9.753
14	19 39 5.99	2.3866	25 17 1.5	3.333	14	21 32 2.36	2.3004	19 54 55.8	9.873
15	19 41 29.18	2.3862	25 13 37.2	3.479	15	21 34 20.31	2.2977	19 44 59.8	9.993
16	19 43 52.34	2.3857	25 10 4.1	3.625	16	21 36 38.10	2.2951	19 34 56.6	10.112
17	19 46 15.47	2.3852	25 6 22.2	3.771	17	21 38 55.72	2.2924	19 24 46.3	10.231
18	19 48 38.57	2.3847	25 2 31.6	3.917	18	21 41 13.18	2.2897	19 14 28.9	10.347
19	19 51 1.63	2.3840	24 58 32.2	4.062	19	21 43 30.48	2.2871	19 4 4.6	10.463
20	19 53 24.65	2.3832	24 54 24.1	4.208	20	21 45 47.63	2.2844	18 53 33.3	10.578
21	19 55 47.62	2.3824	24 50 7.3	4.353	21	21 48 4.62	2.2817	18 42 55.2	10.692
22	19 58 10.53	2.3814	24 45 41.7	4.498	22	21 50 21.45	2.2791	18 32 10.2	10.806
23	20 0 33.38	2.3804	S. 24 41 7.4	4.643	23	21 52 38.11	2.2764	S. 18 21 18.5	10.917
THURSDAY 18.					SATURDAY 20.				
0	20 2 56.18	2.3794	S. 24 36 24.5	4.787	0	21 54 54.61	2.2737	S. 18 10 20.1	11.029
1	20 5 18.91	2.3782	24 31 33.0	4.931	1	21 57 10.96	2.2712	17 59 15.0	11.139
2	20 7 41.57	2.3770	24 26 32.8	5.074	2	21 59 27.15	2.2686	17 48 3.4	11.247
3	20 10 4.15	2.3757	24 21 24.0	5.218	3	22 1 43.19	2.2660	17 36 45.3	11.356
4	20 12 26.66	2.3744	24 16 6.6	5.361	4	22 3 59.07	2.2634	17 25 20.7	11.463
5	20 14 49.08	2.3730	24 10 40.7	5.503	5	22 6 14.80	2.2608	17 13 49.7	11.570
6	20 17 11.42	2.3716	24 5 6.2	5.645	6	22 8 30.37	2.2582	17 2 12.3	11.675
7	20 19 33.67	2.3701	23 59 23.2	5.787	7	22 10 45.79	2.2557	16 50 28.7	11.779
8	20 21 55.83	2.3685	23 53 31.7	5.928	8	22 13 1.06	2.2532	16 38 38.8	11.882
9	20 24 17.89	2.3667	23 47 31.8	6.068	9	22 15 16.17	2.2507	16 26 42.8	11.984
10	20 26 39.84	2.3650	23 41 23.5	6.209	10	22 17 31.14	2.2482	16 14 40.7	12.085
11	20 29 1.69	2.3633	23 35 6.8	6.349	11	22 19 45.96	2.2458	16 2 32.6	12.185
12	20 31 23.44	2.3615	23 28 41.7	6.487	12	22 22 0.64	2.2434	15 50 18.5	12.284
13	20 33 45.07	2.3596	23 22 8.2	6.627	13	22 24 15.17	2.2410	15 37 58.5	12.382
14	20 36 6.59	2.3577	23 15 26.4	6.765	14	22 26 29.56	2.2387	15 25 32.7	12.477
15	20 38 27.99	2.3557	23 8 36.4	6.902	15	22 28 43.81	2.2364	15 13 1.2	12.573
16	20 40 49.27	2.3536	23 1 38.2	7.038	16	22 30 57.92	2.2341	15 0 24.0	12.668
17	20 43 10.42	2.3515	22 54 31.8	7.175	17	22 33 11.90	2.2318	14 47 41.1	12.761
18	20 45 31.45	2.3495	22 47 17.2	7.311	18	22 35 25.74	2.2296	14 34 52.6	12.853
19	20 47 52.36	2.3473	22 39 54.5	7.446	19	22 37 39.45	2.2274	14 21 58.6	12.945
20	20 50 13.13	2.3451	22 32 23.7	7.580	20	22 39 53.03	2.2252	14 8 59.2	13.034
21	20 52 33.77	2.3428	22 24 44.9	7.713	21	22 42 6.48	2.2232	13 55 54.5	13.122
22	20 54 54.27	2.3405	22 16 58.1	7.847	22	22 44 19.81	2.2212	13 42 44.5	13.211
23	20 57 14.63	2.3382	22 9 3.3	7.979	23	22 46 33.02	2.2191	13 29 29.2	13.297
24	20 59 34.86	2.3359	S. 22 1 0.6	8.111	24	22 48 46.10	2.2171	S. 13 16 8.8	13.382

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	SUNDAY 21.					TUESDAY 23.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	22 48 46.10	2.2171	S. 13 16 8.8	13.382	0	0 33 56.79	2.1899	S. 1 19 52.5	15.934
1	22 50 59.07	2.2152	13 2 43.3	13.466	1	0 36 8.22	2.1911	1 3 55.9	15.952
2	22 53 11.92	2.2132	12 49 12.9	13.548	2	0 38 19.72	2.1922	0 47 58.3	15.967
3	22 55 24.66	2.2114	12 35 37.5	13.631	3	0 40 31.29	2.1935	0 31 59.8	15.982
4	22 57 37.29	2.2096	12 21 57.2	13.712	4	0 42 42.94	2.1948	0 16 0.4	15.996
5	22 59 49.81	2.2078	12 8 12.1	13.791	5	0 44 54.67	2.1962	S. 0 0 0.3	16.007
6	23 2 2.23	2.2062	11 54 22.3	13.868	6	0 47 6.49	2.1977	N. 0 16 0.4	16.016
7	23 4 14.55	2.2045	11 40 27.9	13.945	7	0 49 18.40	2.1992	0 32 1.6	16.024
8	23 6 26.77	2.2029	11 26 28.9	14.021	8	0 51 30.40	2.2008	0 48 3.3	16.031
9	23 8 38.90	2.2013	11 12 25.4	14.095	9	0 53 42.50	2.2026	1 4 5.3	16.036
10	23 10 50.93	2.1998	10 58 17.5	14.168	10	0 55 54.71	2.2043	1 20 7.6	16.039
11	23 13 2.88	2.1984	10 44 5.2	14.240	11	0 58 7.02	2.2062	1 36 10.0	16.041
12	23 15 14.74	2.1970	10 29 48.7	14.310	12	1 0 19.45	2.2082	1 52 12.5	16.041
13	23 17 26.52	2.1957	10 15 28.0	14.379	13	1 2 32.00	2.2102	2 8 14.9	16.038
14	23 19 38.22	2.1944	10 1 3.2	14.447	14	1 4 44.67	2.2122	2 24 17.1	16.034
15	23 21 49.85	2.1932	9 46 34.4	14.513	15	1 6 57.46	2.2143	2 40 19.0	16.029
16	23 24 1.40	2.1920	9 32 1.6	14.579	16	1 9 10.39	2.2166	2 56 20.6	16.023
17	23 26 12.89	2.1910	9 17 24.9	14.643	17	1 11 23.45	2.2187	3 12 21.8	16.014
18	23 28 24.32	2.1899	9 2 44.4	14.706	18	1 13 36.64	2.2211	3 28 22.3	16.003
19	23 30 35.68	2.1889	8 48 0.2	14.767	19	1 15 49.98	2.2236	3 44 22.1	15.991
20	23 32 46.99	2.1880	8 33 12.3	14.827	20	1 18 3.47	2.2261	4 0 21.2	15.977
21	23 34 58.24	2.1871	8 18 20.9	14.886	21	1 20 17.11	2.2287	4 16 19.4	15.962
22	23 37 9.44	2.1863	8 3 26.0	14.943	22	1 22 30.91	2.2312	4 32 16.6	15.944
23	23 39 20.60	2.1857	S. 7 48 27.7	15.000	23	1 24 44.86	2.2339	N. 4 48 12.7	15.925
	MONDAY 22.					WEDNESDAY 24.			
0	23 41 31.72	2.1850	S. 7 33 26.0	15.055	0	1 26 58.98	2.2367	N. 5 4 7.6	15.904
1	23 43 42.80	2.1844	7 18 21.1	15.107	1	1 29 13.27	2.2396	5 20 1.2	15.881
2	23 45 53.85	2.1839	7 3 13.1	15.158	2	1 31 27.73	2.2424	5 35 53.3	15.856
3	23 48 4.87	2.1834	6 48 2.1	15.209	3	1 33 42.36	2.2454	5 51 43.9	15.830
4	23 50 15.86	2.1830	6 32 48.0	15.259	4	1 35 57.18	2.2485	6 7 32.9	15.802
5	23 52 26.83	2.1827	6 17 31.0	15.307	5	1 38 12.18	2.2516	6 23 20.1	15.772
6	23 54 37.78	2.1825	6 2 11.2	15.352	6	1 40 27.37	2.2547	6 39 5.5	15.740
7	23 56 48.73	2.1823	5 46 48.7	15.397	7	1 42 42.75	2.2579	6 54 48.9	15.706
8	23 58 59.66	2.1822	5 31 23.5	15.441	8	1 44 58.32	2.2612	7 10 30.2	15.670
9	0 1 10.59	2.1821	5 15 55.8	15.482	9	1 47 14.09	2.2646	7 26 9.3	15.633
10	0 3 21.51	2.1821	5 0 25.6	15.523	10	1 49 30.07	2.2681	7 41 46.2	15.595
11	0 5 32.44	2.1822	4 44 53.0	15.562	11	1 51 46.26	2.2715	7 57 20.7	15.553
12	0 7 43.38	2.1824	4 29 18.1	15.600	12	1 54 2.65	2.2750	8 12 52.6	15.510
13	0 9 54.33	2.1826	4 13 41.0	15.636	13	1 56 19.26	2.2786	8 28 21.9	15.466
14	0 12 5.29	2.1829	3 58 1.8	15.671	14	1 58 36.08	2.2822	8 43 48.5	15.419
15	0 14 16.28	2.1833	3 42 20.5	15.704	15	2 0 53.13	2.2860	8 59 12.2	15.370
16	0 16 27.29	2.1837	3 26 37.3	15.736	16	2 3 10.40	2.2897	9 14 32.9	15.320
17	0 18 38.33	2.1842	3 10 52.2	15.766	17	2 5 27.90	2.2936	9 29 50.6	15.267
18	0 20 49.40	2.1848	2 55 5.4	15.794	18	2 7 45.63	2.2974	9 45 5.0	15.213
19	0 23 0.51	2.1856	2 39 16.9	15.822	19	2 10 3.59	2.3013	10 0 16.2	15.158
20	0 25 11.67	2.1863	2 23 26.8	15.847	20	2 12 21.79	2.3052	10 15 24.0	15.101
21	0 27 22.87	2.1871	2 7 35.2	15.871	21	2 14 40.22	2.3092	10 30 28.3	15.041
22	0 29 34.12	2.1880	1 51 42.3	15.893	22	2 16 58.90	2.3134	10 45 28.9	14.978
23	0 31 45.43	2.1889	1 35 48.0	15.915	23	2 19 17.83	2.3175	11 0 25.7	14.915
24	0 33 56.79	2.1899	S. 1 19 52.5	15.934	24	2 21 37.00	2.3216	N. 11 15 18.7	14.850

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	THURSDAY 25.					SATURDAY 27.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	2 21 37.00	2.3216	N.11 15 18.7	14.850	0	4 18 12.86	2.5332	N.21 17 37.1	9.576
1	2 23 56.42	2.3258	11 30 7.7	14.782	1	4 20 44.97	2.5370	21 27 7.2	9.427
2	2 26 16.10	2.3301	11 44 52.6	14.713	2	4 23 17.30	2.5406	21 36 28.3	9.276
3	2 28 36.03	2.3343	11 59 33.3	14.642	3	4 25 49.84	2.5440	21 45 40.3	9.123
4	2 30 56.22	2.3386	12 14 9.7	14.570	4	4 28 22.58	2.5474	21 54 43.1	8.970
5	2 33 16.66	2.3429	12 28 41.7	14.495	5	4 30 55.53	2.5508	22 3 36.7	8.815
6	2 35 37.37	2.3474	12 43 9.1	14.418	6	4 33 28.68	2.5541	22 12 20.9	8.659
7	2 37 58.35	2.3518	12 57 31.9	14.340	7	4 36 2.02	2.5572	22 20 55.8	8.503
8	2 40 19.59	2.3562	13 11 49.9	14.259	8	4 38 35.54	2.5602	22 29 21.3	8.345
9	2 42 41.10	2.3607	13 26 3.0	14.177	9	4 41 9.25	2.5633	22 37 37.2	8.186
10	2 45 2.87	2.3652	13 40 11.1	14.092	10	4 43 43.14	2.5662	22 45 43.6	8.027
11	2 47 24.91	2.3697	13 54 14.1	14.006	11	4 46 17.19	2.5688	22 53 40.4	7.865
12	2 49 47.23	2.3742	14 8 11.8	13.917	12	4 48 51.40	2.5715	23 1 27.4	7.702
13	2 52 9.82	2.3788	14 22 4.2	13.827	13	4 51 25.77	2.5742	23 9 4.7	7.540
14	2 54 32.69	2.3835	14 35 51.1	13.736	14	4 54 0.30	2.5767	23 16 32.2	7.376
15	2 56 55.84	2.3881	14 49 32.5	13.642	15	4 56 34.97	2.5790	23 23 49.8	7.211
16	2 59 19.26	2.3927	15 3 8.2	13.547	16	4 59 9.78	2.5812	23 30 57.5	7.045
17	3 1 42.96	2.3972	15 16 38.1	13.450	17	5 1 44.71	2.5832	23 37 55.2	6.878
18	3 4 6.93	2.4019	15 30 2.2	13.351	18	5 4 19.77	2.5853	23 44 42.9	6.711
19	3 6 31.18	2.4066	15 43 20.2	13.248	19	5 6 54.95	2.5872	23 51 20.5	6.543
20	3 8 55.71	2.4112	15 56 32.0	13.146	20	5 9 30.24	2.5890	23 57 48.1	6.375
21	3 11 20.53	2.4159	16 9 37.7	13.042	21	5 12 5.63	2.5906	24 4 5.5	6.205
22	3 13 45.63	2.4206	16 22 37.1	12.936	22	5 14 41.11	2.5922	24 10 12.7	6.034
23	3 16 11.00	2.4252	N.16 35 30.0	12.827	23	5 17 16.69	2.5936	N.24 16 9.6	5.863
	FRIDAY 26.					SUNDAY 28.			
0	3 18 36.65	2.4298	N.16 48 16.3	12.717	0	5 19 52.34	2.5947	N.24 21 56.3	5.692
1	3 21 2.58	2.4345	17 0 56.0	12.605	1	5 22 28.06	2.5959	24 27 32.7	5.521
2	3 23 28.79	2.4392	17 13 28.9	12.491	2	5 25 3.85	2.5969	24 32 58.8	5.348
3	3 25 55.28	2.4437	17 25 54.9	12.376	3	5 27 39.69	2.5977	24 38 14.5	5.176
4	3 28 22.04	2.4483	17 38 14.0	12.259	4	5 30 15.58	2.5985	24 43 19.9	5.003
5	3 30 49.08	2.4530	17 50 26.0	12.140	5	5 32 51.51	2.5991	24 48 14.9	4.829
6	3 33 16.40	2.4576	18 2 30.8	12.019	6	5 35 27.47	2.5996	24 52 59.4	4.655
7	3 35 43.99	2.4621	18 14 28.3	11.897	7	5 38 3.46	2.5999	24 57 33.5	4.482
8	3 38 11.85	2.4667	18 26 18.4	11.772	8	5 40 39.46	2.6001	25 1 57.2	4.307
9	3 40 39.99	2.4712	18 38 1.0	11.647	9	5 43 15.47	2.6001	25 6 10.4	4.132
10	3 43 8.39	2.4756	18 49 36.0	11.520	10	5 45 51.47	2.5999	25 10 13.1	3.957
11	3 45 37.06	2.4800	19 1 3.4	11.392	11	5 48 27.46	2.5997	25 14 5.3	3.783
12	3 48 5.99	2.4844	19 12 23.0	11.261	12	5 51 3.44	2.5994	25 17 47.1	3.608
13	3 50 35.19	2.4888	19 23 34.7	11.128	13	5 53 39.39	2.5988	25 21 18.3	3.432
14	3 53 4.65	2.4931	19 34 38.4	10.995	14	5 56 15.30	2.5982	25 24 39.0	3.257
15	3 55 34.36	2.4973	19 45 34.1	10.860	15	5 58 51.17	2.5973	25 27 49.2	3.082
16	3 58 4.33	2.5016	19 56 21.6	10.722	16	6 1 26.98	2.5963	25 30 48.9	2.907
17	4 0 34.55	2.5057	20 7 0.8	10.584	17	6 4 2.73	2.5952	25 33 38.1	2.732
18	4 3 5.02	2.5098	20 17 31.7	10.445	18	6 6 38.41	2.5941	25 36 16.8	2.557
19	4 5 35.73	2.5139	20 27 54.2	10.303	19	6 9 14.01	2.5927	25 38 45.0	2.383
20	4 8 6.69	2.5180	20 38 8.1	10.161	20	6 11 49.53	2.5911	25 41 2.8	2.209
21	4 10 37.89	2.5219	20 48 13.5	10.017	21	6 14 24.95	2.5894	25 43 10.1	2.035
22	4 13 9.32	2.5257	20 58 10.2	9.872	22	6 17 0.26	2.5876	25 45 7.0	1.861
23	4 15 40.98	2.5295	21 7 58.1	9.724	23	6 19 35.46	2.5857	25 46 53.4	1.687
24	4 18 12.86	2.5332	N.21 17 37.1	9.576	24	6 22 10.54	2.5836	N.25 48 29.4	1.513

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	MONDAY 29.			
	h m s	s	° ′ ″	″
0	6 22 10.54	2.5836	N.25 48 29.4	1.513
1	6 24 45.49	2.5813	25 49 55.0	1.341
2	6 27 20.30	2.5789	25 51 10.3	1.168
3	6 29 54.96	2.5763	25 52 15.2	0.996
4	6 32 29.46	2.5737	25 53 9.8	0.825
5	6 35 3.80	2.5708	25 53 54.2	0.654
6	6 37 37.96	2.5679	25 54 28.3	0.482
7	6 40 11.95	2.5649	25 54 52.1	0.312
8	6 42 45.75	2.5617	25 55 5.8	+0.144
9	6 45 19.35	2.5583	25 55 9.4	−0.025
10	6 47 52.75	2.5549	25 55 2.8	0.193
11	6 50 25.94	2.5513	25 54 46.2	0.360
12	6 52 58.91	2.5476	25 54 19.6	0.527
13	6 55 31.65	2.5437	25 53 43.0	0.693
14	6 58 4.16	2.5397	25 52 56.4	0.858
15	7 0 36.42	2.5357	25 52 0.0	1.022
16	7 3 8.44	2.5315	25 50 53.7	1.186
17	7 5 40.20	2.5271	25 49 37.7	1.348
18	7 8 11.69	2.5227	25 48 11.9	1.510
19	7 10 42.92	2.5182	25 46 36.5	1.670
20	7 13 13.87	2.5135	25 44 51.5	1.830
21	7 15 44.54	2.5087	25 42 56.9	1.989
22	7 18 14.92	2.5038	25 40 52.8	2.147
23	7 20 45.00	2.4988	N.25 38 39.2	2.304
	TUESDAY 30.			
0	7 23 14.78	2.4937	N.25 36 16.3	2.459
1	7 25 44.25	2.4886	25 33 44.1	2.614
2	7 28 13.41	2.4832	25 31 2.6	2.768
3	7 30 42.24	2.4778	25 28 11.9	2.921
4	7 33 10.75	2.4725	25 25 12.1	3.072
5	7 35 38.94	2.4670	25 22 3.3	3.222
6	7 38 6.79	2.4613	25 18 45.5	3.371
7	7 40 34.29	2.4555	25 15 18.8	3.519
8	7 43 1.45	2.4497	25 11 43.2	3.667
9	7 45 28.26	2.4438	25 7 58.8	3.812
10	7 47 54.71	2.4379	25 4 5.8	3.956
11	7 50 20.81	2.4319	25 0 4.1	4.100
12	7 52 46.54	2.4257	24 55 53.8	4.242
13	7 55 11.90	2.4196	24 51 35.1	4.382
14	7 57 36.89	2.4134	24 47 8.0	4.522
15	8 0 1.51	2.4072	24 42 32.5	4.660
16	8 2 25.75	2.4007	24 37 48.8	4.797
17	8 4 49.60	2.3943	24 32 56.9	4.932
18	8 7 13.07	2.3879	24 27 56.9	5.067
19	8 9 36.15	2.3814	24 22 48.9	5.200
20	8 11 58.84	2.3749	24 17 32.9	5.332
21	8 14 21.14	2.3683	24 12 9.1	5.462
22	8 16 43.04	2.3616	24 6 37.5	5.592
23	8 19 4.53	2.3549	24 0 58.1	5.720
24	8 21 25.63	2.3482	N.23 55 11.1	5.846

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute
	WEDNESDAY, DECEMBER 1.			
	h m s	s	° ′ ″	″
0	8 21 25.63	2.3482	N.23 55 11.1	5.846

PHASES OF THE MOON.

			d	h	m
☾	Last Quarter . . .	Nov.	4	9	37.8
●	New Moon		12	14	18.3
☽	First Quarter		20	5	29.1
○	Full Moon		26	20	51.9

			d	h
☾	Apogee	Nov.	9	5.4
☾	Perigee		25	1.5

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh	P. L. of Diff.	VIh	P. L. of Diff.	IXh	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
1	Mars	W.	91 19 38	2414	93 2 52	2433	94 45 39	2453	96 27 58	2473
	Saturn	W.	68 57 23	2354	70 42 5	2373	72 26 19	2391	74 10 6	2410
	α Arietis	W.	51 5 2	2549	52 45 7	2561	54 24 56	2573	56 4 28	2586
	Aldebaran	W.	19 56 59	2538	21 37 20	2537	23 17 42	2538	24 58 2	2542
	Regulus	E.	61 25 9	2394	59 41 26	2414	57 58 11	2433	56 15 24	2453
	Jupiter	E.	97 0 21	2445	95 17 50	2464	93 35 46	2483	91 54 10	2502
	Sun	E.	131 15 28	2707	129 38 57	2728	128 2 54	2748	126 27 18	2767
2	Mars	W.	104 52 33	2573	106 32 5	2593	108 11 10	2612	109 49 48	2632
	Saturn	W.	82 42 15	2506	84 23 20	2525	86 3 59	2543	87 44 12	2562
	α Arietis	W.	64 17 30	2658	65 55 7	2674	67 32 22	2689	69 9 16	2706
	Aldebaran	W.	33 17 20	2593	34 56 25	2607	36 35 11	2621	38 13 38	2635
	Regulus	E.	47 48 34	2555	46 8 38	2575	44 29 9	2596	42 50 9	2617
	Jupiter	E.	83 32 52	2600	81 53 57	2619	80 15 28	2638	78 37 25	2657
	Sun	E.	118 35 52	2869	117 2 54	2890	115 30 22	2910	113 58 16	2930
3	Saturn	W.	95 58 57	2652	97 36 41	2670	99 14 1	2687	100 50 58	2704
	α Arietis	W.	77 8 24	2787	78 43 9	2803	80 17 33	2819	81 51 36	2835
	Aldebaran	W.	46 20 46	2713	47 57 9	2728	49 33 12	2744	51 8 54	2759
	Regulus	E.	34 42 13	2722	33 6 3	2744	31 30 22	2766	29 55 10	2789
	Jupiter	E.	70 33 28	2750	68 57 54	2768	67 22 44	2785	65 47 56	2803
	Sun	E.	106 24 2	3028	104 54 24	3047	103 25 9	3065	101 56 17	3083
4	Saturn	W.	108 50 16	2783	110 25 6	2798	111 59 36	2813	113 33 47	2827
	α Arietis	W.	89 36 46	2913	91 8 48	2927	92 40 32	2942	94 11 57	2957
	Aldebaran	W.	59 2 25	2833	60 36 10	2847	62 9 36	2861	63 42 45	2874
	Jupiter	E.	57 59 32	2885	56 26 54	2900	54 54 35	2915	53 22 36	2930
	Sun	E.	94 37 21	3169	93 10 35	3185	91 44 9	3201	90 18 2	3216
5	α Arietis	W.	101 44 32	3026	103 14 12	3039	104 43 36	3052	106 12 44	3065
	Aldebaran	W.	71 24 20	2936	72 55 53	2947	74 27 11	2958	75 58 16	2969
	Pollux	W.	27 12 34	2942	28 44 0	2951	30 15 14	2960	31 46 17	2969
	Jupiter	E.	45 47 10	2999	44 16 57	3012	42 46 59	3024	41 17 16	3036
	Sun	E.	83 11 45	3287	81 47 18	3300	80 23 6	3312	78 59 8	3324
6	Aldebaran	W.	83 30 31	3016	85 0 24	3024	86 30 7	3032	87 59 40	3039
	Pollux	W.	39 18 50	3010	40 48 50	3017	42 18 42	3024	43 48 25	3031
	Jupiter	E.	33 52 16	3092	32 23 56	3103	30 55 50	3113	29 27 56	3123
	Sun	E.	72 2 32	3375	70 39 47	3384	69 17 13	3392	67 54 48	3400
7	Aldebaran	W.	95 25 24	3069	96 54 11	3074	98 22 52	3079	99 51 27	3083
	Pollux	W.	51 15 4	3059	52 44 4	3063	54 12 59	3067	55 41 49	3071
	Sun	E.	61 4 49	3434	59 43 11	3439	58 21 39	3444	57 0 13	3448
8	Aldebaran	W.	107 13 16	3099	108 41 27	3101	110 9 36	3102	111 37 43	3104
	Pollux	W.	63 4 59	3084	64 33 28	3085	66 1 56	3086	67 30 22	3087
	Regulus	W.	27 10 14	3144	28 37 30	3140	30 4 51	3136	31 32 17	3133
	Sun	E.	50 14 4	3464	48 53 0	3466	47 31 58	3468	46 10 58	3470
9	Pollux	W.	74 52 26	3087	76 20 51	3086	77 49 18	3084	79 17 47	3083
	Regulus	W.	38 50 27	3117	40 18 16	3114	41 46 9	3111	43 14 5	3108
	Sun	E.	39 26 12	3470	38 5 14	3470	36 44 16	3469	35 23 17	3467

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh	P. L. of Diff.	XVIIIh	P. L. of Diff.	XXIh	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
1	Mars	W.	98 9 49	2493	99 51 11	2513	101 32 6	2533	103 12 33	2553
	Saturn	W.	75 53 26	2429	77 36 19	2448	79 18 44	2467	81 0 43	2487
	α Arietis	W.	57 43 42	2599	59 22 38	2613	61 1 15	2628	62 39 33	2643
	Aldebaran	W.	26 38 17	2548	28 18 23	2557	29 58 17	2568	31 37 57	2580
	Regulus	E.	54 33 5	2474	52 51 15	2494	51 9 53	2514	49 28 59	2535
	Jupiter	E.	90 13 0	2522	88 32 18	2541	86 52 2	2561	85 12 14	2580
	Sun	E.	124 52 7	2788	123 17 24	2808	121 43 7	2828	120 9 17	2848
2	Mars	W.	111 27 59	2652	113 5 44	2671	114 43 3	2690	116 19 56	2709
	Saturn	W.	89 23 59	2581	91 3 20	2599	92 42 17	2617	94 20 49	2635
	α Arietis	W.	70 45 48	2722	72 21 59	2738	73 57 49	2754	75 33 17	2770
	Aldebaran	W.	39 51 45	2651	41 29 31	2666	43 6 57	2681	44 44 2	2697
	Regulus	E.	41 11 37	2638	39 33 33	2659	37 55 58	2680	36 18 51	2701
	Jupiter	E.	76 59 47	2676	75 22 35	2695	73 45 48	2713	72 9 26	2732
	Sun	E.	112 26 36	2950	110 55 21	2969	109 24 30	2989	107 54 4	3009
3	Saturn	W.	102 27 33	2721	104 3 45	2737	105 39 36	2753	107 15 6	2768
	α Arietis	W.	83 25 19	2851	84 58 41	2867	86 31 43	2883	88 4 24	2898
	Aldebaran	W.	52 44 16	2774	54 19 17	2789	55 53 59	2804	57 28 21	2818
	Regulus	E.	28 20 27	2813	26 46 15	2838	25 12 36	2863	23 39 30	2889
	Jupiter	E.	64 13 32	2820	62 39 30	2836	61 5 49	2853	59 32 30	2869
	Sun	E.	100 27 47	3101	98 59 39	3119	97 31 53	3136	96 4 27	3153
4	Saturn	W.	115 7 40	2841	116 41 15	2854	118 14 32	2867	119 47 33	2879
	α Arietis	W.	95 43 3	2971	97 13 51	2985	98 44 22	2999	100 14 35	3013
	Aldebaran	W.	65 15 37	2887	66 48 12	2900	68 20 30	2912	69 52 33	2924
	Jupiter	E.	51 50 55	2944	50 19 32	2958	48 48 27	2972	47 17 40	2986
	Sun	E.	88 52 12	3231	87 26 40	3246	86 1 26	3260	84 36 28	3273
5	α Arietis	W.	107 41 37	3078	109 10 14	3090	110 38 36	3101	112 6 44	3113
	Aldebaran	W.	77 29 7	2979	78 59 45	2989	80 30 12	2998	82 0 27	3007
	Pollux	W.	33 17 9	2977	34 47 50	2986	36 18 20	2994	37 48 40	3002
	Jupiter	E.	39 47 48	3048	38 18 35	3059	36 49 35	3070	35 20 49	3081
	Sun	E.	77 35 24	3335	76 11 53	3345	74 48 34	3356	73 25 27	3366
6	Aldebaran	W.	89 29 5	3046	90 58 21	3052	92 27 29	3058	93 56 30	3064
	Pollux	W.	45 17 59	3037	46 47 26	3043	48 16 45	3048	49 45 58	3054
	Jupiter	E.	28 0 15	3134	26 32 47	3145	25 5 32	3156	23 38 30	3167
	Sun	E.	66 32 32	3408	65 10 24	3415	63 48 25	3422	62 26 33	3428
7	Aldebaran	W.	101 19 57	3087	102 48 23	3090	104 16 44	3093	105 45 2	3096
	Pollux	W.	57 10 34	3074	58 39 15	3077	60 7 53	3080	61 36 27	3082
	Sun	E.	55 38 51	3452	54 17 34	3456	52 56 21	3459	51 35 11	3462
8	Aldebaran	W.	113 5 48	3105	114 33 51	3106	116 1 53	3107	117 29 54	3107
	Pollux	W.	68 58 48	3087	70 27 13	3088	71 55 37	3088	73 24 1	3087
	Regulus	W.	32 59 47	3129	34 27 21	3126	35 54 59	3123	37 22 41	3120
	Sun	E.	44 50 0	3471	43 29 3	3471	42 8 6	3471	40 47 9	3471
9	Pollux	W.	80 46 17	3081	82 14 49	3079	83 43 24	3077	85 12 2	3074
	Regulus	W.	44 42 5	3105	46 10 9	3101	47 38 18	3097	49 6 31	3094
	Sun	E.	34 2 16	3466	32 41 14	3464	31 20 9	3462	29 59 3	3460

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh	P. L. of Diff.	VIh	P. L. of Diff.	IXh	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
10	Pollux	W.	86 40 43	3072	88 9 27	3069	89 38 15	3066	91 7 6	3062
	Regulus	W.	50 34 48	3090	52 3 10	3086	53 31 36	3082	55 0 8	3078
	Sun	E.	28 37 54	3457	27 16 42	3455	25 55 28	3452	24 34 10	3449
14	Sun	W.	15 39 23	3283	17 3 54	3274	18 28 36	3264	19 53 30	3254
	a Pegasi	E.	104 11 53	3331	102 48 17	3319	101 24 27	3307	100 0 23	3295
	Mars	E.	111 4 10	2995	109 33 51	2987	108 3 22	2980	106 32 44	2973
15	Sun	W.	27 0 50	3207	28 26 51	3198	29 53 3	3188	31 19 26	3179
	a Pegasi	E.	92 56 58	3246	91 31 43	3238	90 6 19	3230	88 40 45	3223
	Mars	E.	98 57 22	2937	97 25 50	2929	95 54 8	2921	94 22 16	2914
	Saturn	E.	117 49 6	2817	116 15 0	2810	114 40 45	2802	113 6 20	2794
16	Sun	W.	38 34 5	3133	40 1 35	3124	41 29 16	3114	42 57 9	3103
	a Pegasi	E.	81 30 57	3193	80 4 39	3188	78 38 16	3184	77 11 48	3181
	Mars	E.	86 40 30	2874	85 7 38	2866	83 34 35	2857	82 1 21	2849
	Saturn	E.	105 11 35	2753	103 36 6	2744	102 0 25	2735	100 24 32	2727
17	Sun	W.	50 19 39	3053	51 48 46	3042	53 18 6	3031	54 47 40	3020
	a Pegasi	E.	69 58 42	3174	68 32 2	3175	67 5 23	3177	65 38 47	3180
	Mars	E.	74 12 25	2805	72 38 3	2795	71 3 29	2786	69 28 43	2777
	Saturn	E.	92 22 12	2681	90 45 7	2672	89 7 50	2662	87 30 19	2652
	a Arietis	E.	111 51 15	2821	110 17 15	2809	108 42 59	2797	107 8 27	2785
18	Sun	W.	62 18 54	2965	63 49 51	2953	65 21 3	2941	66 52 30	2929
	a Pegasi	E.	58 27 10	3216	57 1 20	3228	55 35 44	3242	54 10 23	3258
	Mars	E.	61 31 43	2728	59 55 40	2717	58 19 23	2707	56 42 53	2697
	Saturn	E.	79 19 22	2601	77 40 29	2591	76 1 21	2580	74 21 58	2569
	a Arietis	E.	99 11 56	2726	97 35 51	2715	95 59 31	2704	94 22 56	2692
19	Sun	W.	74 33 36	2867	76 6 37	2855	77 39 54	2842	79 13 28	2828
	Mars	E.	48 36 53	2645	46 58 59	2634	45 20 50	2624	43 42 27	2613
	Saturn	E.	66 1 16	2513	64 20 21	2501	62 39 9	2489	60 57 41	2477
	a Arietis	E.	86 16 10	2635	84 38 3	2624	82 59 41	2613	81 21 3	2602
	Aldebaran	E.	116 44 51	2553	115 4 51	2540	113 24 34	2528	111 44 0	2515
20	Sun	W.	87 5 33	2763	88 40 50	2749	90 16 25	2736	91 52 17	2722
	Mars	E.	35 27 0	2562	33 47 13	2553	32 7 14	2545	30 27 3	2537
	Saturn	E.	52 26 8	2417	50 42 58	2405	48 59 31	2393	47 15 46	2380
	a Arietis	E.	73 4 15	2549	71 24 10	2539	69 43 51	2530	68 3 19	2520
	Aldebaran	E.	103 16 46	2453	101 34 26	2440	99 51 48	2427	98 8 52	2415
21	Sun	W.	99 56 8	2655	101 33 49	2642	103 11 47	2629	104 50 3	2615
	a Aquilæ	W.	50 17 51	3859	51 31 52	3772	52 47 23	3693	54 4 18	3619
	Saturn	E.	38 32 37	2320	36 47 7	2308	35 1 19	2296	33 15 14	2285
	a Arietis	E.	59 37 31	2479	57 55 48	2473	56 13 56	2467	54 31 56	2462
	Aldebaran	E.	89 29 41	2352	87 44 57	2340	85 59 55	2328	84 14 36	2316
22	Sun	W.	113 5 48	2552	114 45 49	2540	116 26 6	2529	118 6 39	2517
	a Aquilæ	W.	60 47 7	3324	62 10 51	3277	63 35 29	3234	65 0 58	3193
	Aldebaran	E.	75 23 40	2258	73 36 39	2247	71 49 21	2237	70 1 48	2227
	Pollux	E.	119 32 54	2244	117 45 32	2232	115 57 52	2221	114 9 56	2210

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XV^{h}	P. L. of Diff.	XVIII^{h}	P. L. of Diff.	XXI^{h}	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
10	Pollux	W.	92 36 2	3059	94 5 2	3055	95 34 7	3051	97 3 17	3047
	Regulus	W.	56 28 44	3073	57 57 26	3069	59 26 13	3065	60 55 6	3060
	SUN	E.	23 12 50	3447	21 51 26	3445	20 30 0	3442	19 8 31	3438
14	SUN	W.	21 18 35	3244	22 43 52	3235	24 9 20	3225	25 35 0	3216
	a Pegasi	E.	98 36 6	3285	97 11 37	3275	95 46 55	3265	94 22 2	3255
	MARS	E.	105 1 58	2966	103 31 3	2959	101 59 59	2951	100 28 45	2944
15	SUN	W.	32 46 0	3170	34 12 45	3161	35 39 40	3152	37 6 47	3143
	a Pegasi	E.	87 15 3	3216	85 49 12	3210	84 23 14	3204	82 57 9	3198
	MARS	E.	92 50 15	2906	91 18 4	2898	89 45 43	2891	88 13 12	2882
	SATURN	E.	111 31 44	2786	109 56 58	2778	108 22 1	2769	106 46 53	2762
16	SUN	W.	44 25 15	3093	45 53 32	3083	47 22 2	3073	48 50 44	3063
	a Pegasi	E.	75 45 16	3178	74 18 40	3176	72 52 2	3175	71 25 22	3174
	MARS	E.	80 27 57	2840	78 54 21	2831	77 20 34	2822	75 46 35	2814
	SATURN	E.	98 48 28	2718	97 12 12	2709	95 35 44	2700	93 59 4	2691
17	SUN	W.	56 17 27	3009	57 47 28	2998	59 17 42	2987	60 48 11	2976
	a Pegasi	E.	64 12 14	3184	62 45 46	3190	61 19 25	3197	59 53 12	3206
	MARS	E.	67 53 45	2767	66 18 34	2757	64 43 10	2747	63 7 33	2738
	SATURN	E.	85 52 35	2642	84 14 37	2632	82 36 26	2622	80 58 1	2612
	a Arietis	E.	105 33 40	2773	103 58 37	2762	102 23 19	2750	100 47 45	2738
18	SUN	W.	68 24 12	2917	69 56 9	2905	71 28 22	2892	73 0 51	2880
	a Pegasi	E.	52 45 22	3277	51 20 44	3300	49 56 32	3326	48 32 50	3357
	MARS	E.	55 6 9	2687	53 29 11	2676	51 51 59	2666	50 14 33	2656
	SATURN	E.	72 42 20	2558	71 2 27	2547	69 22 19	2535	67 41 55	2524
	a Arietis	E.	92 46 5	2681	91 8 59	2669	89 31 38	2658	87 54 2	2646
19	SUN	W.	80 47 19	2815	82 21 27	2802	83 55 51	2789	85 30 33	2776
	MARS	E.	42 3 50	2603	40 24 59	2592	38 45 53	2582	37 6 33	2572
	SATURN	E.	59 15 56	2465	57 33 54	2454	55 51 36	2442	54 9 1	2429
	a Arietis	E.	79 42 11	2591	78 3 4	2580	76 23 42	2570	74 44 6	2559
	Aldebaran	E.	110 3 8	2503	108 21 59	2490	106 40 33	2477	104 58 48	2465
20	SUN	W.	93 28 27	2709	95 4 55	2695	96 41 41	2682	98 18 45	2668
	MARS	E.	28 46 40	2530	27 6 8	2523	25 25 27	2517	23 44 38	2513
	SATURN	E.	45 31 43	2368	43 47 23	2356	42 2 45	2344	40 17 50	2332
	a Arietis	E.	66 22 34	2511	64 41 36	2502	63 0 25	2494	61 19 3	2487
	Aldebaran	E.	96 25 38	2402	94 42 6	2389	92 58 16	2377	91 14 8	2364
21	SUN	W.	106 28 37	2602	108 7 29	2590	109 46 38	2577	111 26 4	2564
	a Aquilæ	W.	55 22 32	3551	56 42 0	3488	58 2 37	3429	59 24 21	3374
	SATURN	E.	31 28 52	2273	29 42 13	2262	27 55 18	2251	26 8 6	2239
	a Arietis	E.	52 49 48	2458	51 7 34	2455	49 25 17	2453	47 42 58	2453
	Aldebaran	E.	82 28 59	2304	80 43 5	2292	78 56 53	2281	77 10 25	2269
22	SUN	W.	119 47 29	2506	121 28 34	2495	123 9 55	2484	124 51 31	2474
	a Aquilæ	W.	66 27 16	3155	67 54 19	3121	69 22 3	3089	70 50 26	3059
	Aldebaran	E.	68 14 0	2217	66 25 57	2207	64 37 40	2198	62 49 9	2189
	Pollux	E.	112 21 43	2199	110 33 14	2189	108 44 30	2179	106 55 31	2169

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh	P. L. of Diff.	VIh	P. L. of Diff.	IXh	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
23	α Aquilæ	W.	72 19 26	3032	73 49 0	3007	75 19 4	2984	76 49 37	2963
	Aldebaran	E.	61 0 25	2181	59 11 29	2174	57 22 21	2167	55 33 3	2160
	Pollux	E.	105 6 17	2160	103 16 49	2151	101 27 8	2143	99 37 14	2135
24	α Aquilæ	W.	84 28 3	2890	86 0 35	2881	87 33 18	2875	89 6 9	2870
	α Pegasi	W.	37 20 19	3411	38 42 23	3300	40 6 34	3205	41 32 37	3122
	Mars	W.	21 1 6	2274	22 47 44	2259	24 34 44	2246	26 22 3	2235
	Aldebaran	E.	46 24 16	2136	44 34 12	2134	42 44 4	2133	40 53 54	2132
	Pollux	E.	90 24 52	2101	88 33 55	2096	86 42 50	2092	84 51 38	2088
25	α Aquilæ	W.	96 51 8	2876	98 23 58	2883	99 56 38	2893	101 29 6	2905
	α Pegasi	W.	49 4 47	2829	50 38 37	2788	52 13 20	2753	53 48 49	2723
	Mars	W.	35 21 52	2204	37 10 14	2202	38 58 39	2200	40 47 7	2200
	Saturn	W.	19 54 38	2068	21 46 27	2066	23 38 18	2066	25 30 10	2066
	Pollux	E.	75 34 25	2077	73 42 51	2077	71 51 16	2077	69 59 41	2078
	Regulus	E.	111 43 42	2088	109 52 24	2087	108 1 5	2087	106 9 46	2087
26	α Pegasi	W.	61 54 55	2619	63 33 24	2607	65 12 9	2598	66 51 7	2590
	Mars	W.	49 49 12	2209	51 37 26	2213	53 25 33	2218	55 13 33	2224
	Saturn	W.	34 49 5	2078	36 40 39	2083	38 32 5	2088	40 23 23	2093
	Pollux	E.	60 42 33	2093	58 51 24	2098	57 0 22	2104	55 9 29	2111
	Regulus	E.	96 53 44	2101	95 2 46	2106	93 11 56	2111	91 21 14	2117
27	α Pegasi	W.	75 7 39	2581	76 47 0	2584	78 26 16	2589	80 5 26	2595
	Mars	W.	64 10 59	2265	65 57 50	2275	67 44 27	2285	69 30 48	2296
	Saturn	W.	49 37 20	2133	51 27 29	2143	53 17 23	2153	55 7 2	2164
	α Arietis	W.	31 29 40	2539	33 9 59	2515	34 50 52	2494	36 32 13	2477
	Pollux	E.	45 57 58	2154	44 8 21	2165	42 19 0	2176	40 29 56	2187
	Regulus	E.	82 10 22	2158	80 20 50	2168	78 31 34	2179	76 42 34	2190
	Jupiter	E.	122 29 5	2200	120 40 38	2210	118 52 26	2220	117 4 29	2231
28	α Pegasi	W.	88 18 30	2647	89 56 21	2661	91 33 54	2676	93 11 6	2692
	Mars	W.	78 18 10	2361	80 2 40	2376	81 46 49	2391	83 30 36	2406
	Saturn	W.	64 10 51	2227	65 58 39	2241	67 45 6	2255	69 33 12	2270
	α Arietis	W.	45 3 4	2448	46 45 30	2450	48 27 53	2454	50 10 11	2460
	Pollux	E.	31 29 25	2259	29 42 25	2276	27 55 49	2294	26 9 40	2313
	Regulus	E.	67 42 3	2254	65 54 56	2269	64 8 10	2284	62 21 47	2299
	Jupiter	E.	108 8 58	2293	106 22 48	2307	104 36 59	2322	102 51 31	2336
29	α Pegasi	W.	101 11 13	2790	102 45 54	2813	104 20 6	2837	105 53 46	2862
	Mars	W.	92 3 53	2489	93 45 21	2508	95 26 23	2525	97 7 1	2543
	Saturn	W.	78 23 4	2349	80 7 52	2366	81 52 16	2383	83 36 15	2401
	α Arietis	W.	58 39 12	2504	60 20 20	2516	62 1 11	2529	63 41 44	2542
	Regulus	E.	53 35 40	2383	51 51 41	2401	50 8 7	2419	48 25 0	2438
	Jupiter	E.	94 9 42	2416	92 26 30	2433	90 43 42	2450	89 1 18	2467
30	Mars	W.	105 23 54	2637	107 1 59	2656	108 39 39	2675	110 16 53	2694
	Saturn	W.	92 9 56	2489	93 51 25	2507	95 32 29	2525	97 13 8	2543
	α Arietis	W.	71 59 41	2616	73 38 14	2632	75 16 26	2648	76 54 16	2664
	Regulus	E.	39 56 8	2537	38 15 46	2558	36 35 52	2579	34 56 28	2601
	Jupiter	E.	80 35 30	2556	78 55 35	2574	77 16 5	2593	75 37 0	2611
	Spica	E.	93 58 3	2520	92 17 18	2539	90 36 59	2556	88 57 4	2574

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XV^{h}	P. L. of Diff.	XVIII^{h}	P. L. of Diff.	XXI^{h}	P. L of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
23	α Aquilæ	W.	78 20 37	2944	79 52 0	2928	81 23 43	2913	82 55 45	2901
	Aldebaran	E.	53 43 34	2153	51 53 56	2148	50 4 9	2143	48 14 15	2139
	Pollux	E.	97 47 7	2127	95 56 49	2120	94 6 20	2113	92 15 41	2107
24	α Aquilæ	W.	90 39 7	2866	92 12 9	2866	93 45 11	2868	95 18 11	2871
	α Pegasi	W.	43 0 20	3048	44 29 33	2982	46 0 8	2925	47 31 55	2874
	Mars	W.	28 9 38	2226	29 57 27	2218	31 45 27	2212	33 33 36	2208
	Aldebaran	E.	39 3 43	2133	37 13 33	2135	35 23 27	2138	33 33 26	2141
	Pollux	E.	83 0 20	2085	81 8 57	2082	79 17 29	2079	77 25 58	2078
25	α Aquilæ	W.	103 1 19	2919	104 33 14	2936	106 4 47	2955	107 35 56	2976
	α Pegasi	W.	55 24 58	2696	57 1 43	2672	58 39 1	2652	60 16 46	2634
	Mars	W.	42 35 35	2200	44 24 3	2201	46 12 29	2203	48 0 53	2206
	Saturn	W.	27 22 2	2067	29 13 53	2069	31 5 41	2071	32 57 25	2074
	Pollux	E.	68 8 8	2080	66 16 38	2082	64 25 11	2085	62 33 49	2089
	Regulus	E.	104 18 27	2088	102 27 10	2091	100 35 57	2094	98 44 48	2097
26	α Pegasi	W.	68 30 16	2585	70 9 32	2581	71 48 53	2580	73 28 16	2580
	Mars	W.	57 1 24	2231	58 49 6	2239	60 36 36	2247	62 23 54	2256
	Saturn	W.	42 14 33	2099	44 5 33	2107	45 56 21	2115	47 46 57	2124
	Pollux	E.	53 18 47	2118	51 28 15	2126	49 37 56	2135	47 47 50	2144
	Regulus	E.	89 30 41	2124	87 40 18	2132	85 50 7	2139	84 0 8	2148
27	α Pegasi	W.	81 44 28	2603	83 23 19	2612	85 1 57	2623	86 40 21	2634
	Mars	W.	71 16 53	2308	73 2 40	2321	74 48 9	2334	76 33 19	2347
	Saturn	W.	56 56 24	2176	58 45 28	2188	60 34 15	2200	62 22 43	2213
	α Arietis	W.	38 13 58	2465	39 56 1	2456	41 38 16	2451	43 20 38	2448
	Pollux	E.	38 41 9	2200	36 52 41	2214	35 4 34	2228	33 16 48	2243
	Regulus	E.	74 53 51	2202	73 5 25	2214	71 17 19	2227	69 29 31	2240
	Jupiter	E.	115 16 47	2243	113 29 22	2255	111 42 16	2267	109 55 28	2280
28	α Pegasi	W.	94 47 56	2710	96 24 23	2728	98 0 26	2747	99 36 3	2768
	Mars	W.	85 14 2	2422	86 57 5	2438	88 39 45	2455	90 22 1	2472
	Saturn	W.	71 19 56	2285	73 6 18	2301	74 52 17	2317	76 37 52	2333
	α Arietis	W.	51 52 21	2467	53 34 21	2475	55 16 11	2484	56 57 49	2493
	Pollux	E.	24 23 58	2333	22 38 46	2354	20 54 4	2376	19 9 55	2400
	Regulus	E.	60 35 46	2315	58 50 9	2331	57 4 55	2348	55 20 5	2365
	Jupiter	E.	101 6 24	2351	99 21 39	2367	97 37 17	2383	95 53 18	2399
29	α Pegasi	W.	107 26 54	2888	108 59 29	2915	110 31 29	2943	112 2 54	2972
	Mars	W.	98 47 15	2561	100 27 3	2580	102 6 25	2599	103 45 22	2618
	Saturn	W.	85 19 49	2418	87 2 58	2436	88 45 42	2453	90 28 2	2471
	α Arietis	W.	65 21 58	2556	67 1 54	2570	68 41 30	2585	70 20 46	2600
	Regulus	E.	46 42 19	2457	45 0 5	2476	43 18 18	2496	41 36 59	2516
	Jupiter	E.	87 19 19	2485	85 37 44	2503	83 56 35	2520	82 15 50	2538
30	Mars	W.	111 53 42	2713	113 30 5	2732	115 6 3	2751	116 41 35	2771
	Saturn	W.	98 53 22	2561	100 33 11	2579	102 12 35	2597	103 51 35	2615
	α Arietis	W.	78 31 44	2681	80 8 49	2698	81 45 32	2715	83 21 52	2732
	Regulus	E.	33 17 33	2623	31 39 9	2646	30 1 17	2670	28 23 58	2694
	Jupiter	E.	73 58 20	2629	72 20 5	2648	70 42 15	2666	69 4 49	2684
	Spica	E.	87 17 34	2593	85 38 29	2610	83 59 48	2629	82 21 32	2646

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S Apparent Right Ascension.	THE SUN'S Diff. for 1 Hour.	THE SUN'S Apparent Declination.	THE SUN'S Diff. for 1 Hour.	THE SUN'S Semi-diameter.	Sidereal Time of Semi-diameter Passing Meridian.	Equation of Time, to be Subtracted from / Added to Apparent Time.	Diff. for 1 Hour.
		h m s	s	° ′ ″	″	′ ″	s	m s	s
Wed.	1	16 27 45.37	10.785	S. 21 45 33.4	−23.71	16 15.34	70.22	11 1.15	0.926
Thur.	2	16 32 4.55	10.813	21 54 49.9	22.66	16 15.49	70.31	10 38.59	0.953
Frid.	3	16 36 24.38	10.839	22 3 41.2	21.61	16 15.63	70.39	10 15.39	0.980
Sat.	4	16 40 44.83	10.865	22 12 7.1	−20.54	16 15.77	70.47	9 51.56	1.006
SUN.	5	16 45 5.90	10.890	22 20 7.2	19.47	16 15.90	70.55	9 27.12	1.031
Mon.	6	16 49 27.55	10.913	22 27 41.3	18.38	16 16.03	70.62	9 2.10	1.053
Tues.	7	16 53 49.73	10.936	22 34 49.2	−17.28	16 16.15	70.69	8 36.54	1.075
Wed.	8	16 58 12.44	10.957	22 41 30.6	16.17	16 16.27	70.76	8 10.46	1.097
Thur.	9	17 2 35.66	10.977	22 47 45.2	15.05	16 16.39	70.82	7 43.87	1.117
Frid.	10	17 6 59.34	10.995	22 53 32.9	−13.92	16 16.50	70.88	7 16.82	1.135
Sat.	11	17 11 23.44	11.012	22 58 53.6	12.78	16 16.61	70.93	6 49.35	1.152
SUN.	12	17 15 47.95	11.028	23 3 47.0	11.64	16 16.72	70.98	6 21.48	1.168
Mon.	13	17 20 12.82	11.043	23 8 12.8	−10.49	16 16.82	71.03	5 53.24	1.183
Tues.	14	17 24 38.02	11.056	23 12 11.0	9.34	16 16.92	71.07	5 24.68	1.196
Wed.	15	17 29 3.52	11.068	23 15 41.4	8.18	16 17.02	71.11	4 55.82	1.207
Thur.	16	17 33 29.28	11.078	23 18 43.9	− 7.02	16 17.11	71.14	4 26.70	1.217
Frid.	17	17 37 55.25	11.086	23 21 18.3	5.85	16 17.20	71.17	3 57.36	1.226
Sat.	18	17 42 21.40	11.093	23 23 24.6	4.68	16 17.28	71.20	3 27.85	1.233
SUN.	19	17 46 47.70	11.098	23 25 2.8	− 3.50	16 17.36	71.22	2 58.19	1.238
Mon.	20	17 51 14.12	11.102	23 26 12.7	2.32	16 17.43	71.24	2 28.42	1.241
Tues.	21	17 55 40.61	11.104	23 26 54.3	− 1.14	16 17.50	71.25	1 58.57	1.244
Wed.	22	18 0 7.15	11.105	23 27 7.6	+ 0.04	16 17.56	71.26	1 28.67	1.246
Thur.	23	18 4 33.70	11.105	23 26 52.5	1.22	16 17.62	71.26	0 58.76	1.245
Frid.	24	18 9 0.21	11.103	23 26 9.2	2.39	16 17.68	71.26	0 28.89	1.243
Sat.	25	18 13 26.66	11.100	23 24 57.6	+ 3.57	16 17.72	71.25	0 0.93	1.240
SUN.	26	18 17 53.03	11.096	23 23 17.8	4.74	16 17.76	71.24	0 30.66	1.236
Mon.	27	18 22 19.29	11.091	23 21 9.9	5.92	16 17.79	71.23	1 0.28	1.231
Tues.	28	18 26 45.43	11.085	23 18 33.6	+ 7.09	16 17.82	71.21	1 29.77	1.225
Wed.	29	18 31 11.41	11.078	23 15 29.3	8.26	16 17.84	71.18	1 59.10	1.217
Thur.	30	18 35 37.18	11.069	23 11 57.2	9.42	16 17.85	71.15	2 28.24	1.208
Frid.	31	18 40 2.72	11.059	23 7 57.2	10.58	16 17.86	71.11	2 57.15	1.198
Sat.	32	18 44 28.00	11.048	S. 23 3 29.5	+11.73	16 17.87	71.07	3 25.80	1.187

NOTE.—The mean time of semidiameter passing the meridian **may** be found by subtracting $0^s.19$ from the sidereal **time.** **The sign** − prefixed to the hourly change of declination indicates that south declinations are increasing; the sign + indicates that south declinations are decreasing.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S Apparent Right Ascension.	THE SUN'S Diff. for 1 Hour.	THE SUN'S Apparent Declination.	THE SUN'S Diff. for 1 Hour.	Equation of Time, to be Added to / Subtracted from Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		h m s	s	° ′ ″	″	m s	s	h m s
Wed.	1	16 27 47.35	10.783	S. 21 45 37.7	−23.69	11 0.98	0.926	16 38 48.33
Thur.	2	16 32 6.47	10.810	21 54 53.9	22.64	10 38.42	0.953	16 42 44.89
Frid.	3	16 36 26.23	10.836	22 3 44.9	21.58	10 15.22	0.980	16 46 41.45
Sat.	4	16 40 46.62	10.861	22 12 10.4	−20.52	9 51.39	1.006	16 50 38.01
SUN.	5	16 45 7.62	10.886	22 20 10.2	19.44	9 26.95	1.031	16 54 34.56
Mon.	6	16 49 29.21	10.909	22 27 44.1	18.36	9 1.93	1.053	16 58 31.12
Tues.	7	16 53 51.30	10.932	22 34 51.7	−17.26	8 36.38	1.075	17 2 27.68
Wed.	8	16 58 13.93	10.953	22 41 32.8	16.15	8 10.31	1.097	17 6 24.24
Thur.	9	17 2 37.07	10.973	22 47 47.2	15.03	7 43.73	1.117	17 10 20.80
Frid.	10	17 7 0.67	10.992	22 53 34.7	−13.91	7 16.69	1.135	17 14 17.36
Sat.	11	17 11 24.69	11.009	22 58 55.1	12.78	6 49.22	1.152	17 18 13.91
SUN.	12	17 15 49.12	11.025	23 3 48.2	11.63	6 21.35	1.168	17 22 10.47
Mon.	13	17 20 13.91	11.040	23 8 13.8	−10.48	5 53 12	1.183	17 26 7.03
Tues.	14	17 24 39.02	11.053	23 12 11.8	9.33	5 24.57	1.196	17 30 3.59
Wed.	15	17 29 4.43	11.064	23 15 42.0	8.17	4 55.72	1.207	17 34 0.15
Thur.	16	17 33 30.10	11.074	23 18 44.3	− 7.01	4 26.61	1.217	17 37 56.71
Frid.	17	17 37 55.98	11.082	23 21 18.6	5.83	3 57.28	1.226	17 41 53.26
Sat.	18	17 42 22.04	11.089	23 23 24.9	4.66	3 27.77	1.233	17 45 49.82
SUN.	19	17 46 48.26	11.095	23 25 3.0	− 3.49	2 58.12	1.238	17 49 46.38
Mon.	20	17 51 14.58	11.099	23 26 12.8	2.31	2 28.36	1.241	17 53 42.94
Tues.	21	17 55 40.97	11.101	23 26 54.3	− 1.13	1 58.51	1.244	17 57 39.50
Wed.	22	18 0 7.41	11.102	23 27 7.6	+ 0.04	1 28.62	1.246	18 1 36.06
Thur.	23	18 4 33.86	11.101	23 26 52.5	1.22	0 58.74	1.245	18 5 32.62
Frid.	24	18 9 0.28	11.099	23 26 9.2	2.40	0 28.89	1.243	18 9 29.18
Sat.	25	18 13 26.65	11.097	23 24 57.6	+ 3.57	0 0.92	1.240	18 13 25.73
SUN.	26	18 17 52.94	11.093	23 23 17.8	4.74	0 30.65	1.236	18 17 22.29
Mon.	27	18 22 19.12	11.088	23 21 9.9	5.92	1 0.27	1.231	18 21 18.85
Tues.	28	18 26 45.16	11.081	23 18 33.8	+ 7.09	1 29.75	1.225	18 25 15.41
Wed.	29	18 31 11.04	11.074	23 15 29.7	8.26	1 59.07	1.217	18 29 11.97
Thur.	30	18 35 36.72	11.065	23 11 57.7	9.42	2 28.19	1.208	18 33 8.53
Frid.	31	18 40 2.17	11.055	23 7 57.8	10.58	2 57.08	1.198	18 37 5.09
Sat.	32	18 44 27.37	11.044	S. 23 3 30.2	+11.73	3 25.73	1.187	18 41 1.64

Note.—The semidiameter for mean noon may be assumed the same as that for apparent noon. The sign − prefixed to the hourly change of declination indicates that south declinations are increasing; the sign + indicates that south declinations are decreasing.

Diff. for 1 Hour, $+9^s.8565$. (Table III.)

AT GREENWICH MEAN NOON.

Day of the Month.	Day of the Year.	THE SUN'S						Mean Time of Sidereal Noon.
		TRUE LONGITUDE.		Diff. for 1 Hour.	LATITUDE.	Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	
		λ	λ′					
		° ′ ″	′ ″	″	″			h m s
1	335	248 40 47.1	40 17.8	152.07	+ 0.10	9.993 7930	− 27.5	7 19 59.39
2	336	249 41 37.5	41 8.0	152.13	0.16	9.993 7280	26.6	7 16 3.48
3	337	250 42 29.3	41 59.6	152.18	0.20	9.993 6651	25.8	7 12 7.57
4	338	251 43 22.4	42 52.6	152.24	+ 0.22	9.993 6043	− 24.9	7 8 11.65
5	339	252 44 16.9	43 46.9	152.30	0.20	9.993 5454	24.1	7 4 15.74
6	340	253 45 12.7	44 42.4	152.35	0.16	9.993 4884	23.3	7 0 19.83
7	341	254 46 9.7	45 39.2	152.40	+ 0.09	9.993 4332	− 22.6	6 56 23.92
8	342	255 47 7.8	46 37.2	152.45	0.00	9.993 3798	21.9	6 52 28.00
9	343	256 48 7.1	47 36.3	152.49	− 0.10	9.993 3280	21.2	6 48 32.09
10	344	257 49 7.5	48 36.5	152.53	− 0.23	9.993 2778	− 20.6	6 44 36.18
11	345	258 50 8.8	49 37.6	152.57	0.35	9.993 2292	19.9	6 40 40.27
12	346	259 51 11.0	50 39.7	152.61	0.49	9.993 1821	19.3	6 36 44.35
13	347	260 52 14.0	51 42.5	152.64	− 0.62	9.993 1365	− 18.7	6 32 48.44
14	348	261 53 17.8	52 46.0	152.67	0.74	9.993 0924	18.0	6 28 52.53
15	349	262 54 22.1	53 50.2	152.69	0.85	9.993 0500	17.4	6 24 56.62
16	350	263 55 26.9	54 54.8	152.71	− 0.93	9.993 0091	− 16.7	6 21 0.70
17	351	264 56 32.2	55 59.9	152.73	0.98	9.992 9699	15.9	6 17 4.79
18	352	265 57 37.9	57 5.4	152.74	1.01	9.992 9326	15.1	6 13 8.88
19	353	266 58 43.8	58 11.1	152.75	− 0.98	9.992 8971	− 14.3	6 9 12.97
20	354	267 59 50.0	59 17.1	152.76	0.93	9.992 8637	13.4	6 5 17.06
21	355	269 0 56.3	0 23.2	152.77	0.85	9.992 8327	12.4	6 1 21.14
22	356	270 2 2.7	1 29.4	152.77	− 0.75	9.992 8041	− 11.4	5 57 25.23
23	357	271 3 9.3	2 35.8	152.78	0.64	9.992 7780	10.3	5 53 29.32
24	358	272 4 16.0	3 42.4	152.79	0.50	9.992 7546	9.2	5 49 33.40
25	359	273 5 23.0	4 49.2	152.79	− 0.35	9.992 7340	− 8.0	5 45 37.49
26	360	274 6 30.1	5 56.1	152.80	0.22	9.992 7162	6.8	5 41 41.58
27	361	275 7 37.5	7 3.3	152.81	− 0.10	9.992 7013	5.6	5 37 45.66
28	362	276 8 45.2	8 10.7	152.82	0.00	9.992 6894	− 4.4	5 33 49.75
29	363	277 9 53.1	9 18.5	152.84	+ 0.09	9.992 6802	3.2	5 29 53.84
30	364	278 11 1.4	10 26.6	152.85	0.13	9.992 6738	2.1	5 25 57.93
31	365	279 12 10.0	11 35.0	152.86	0.16	9.992 6701	− 1.0	5 22 2.01
32	366	280 13 18.9	12 43.7	152.88	+ 0.14	9.992 6689	0.0	5 18 6.10

Note.—The numbers in column λ correspond to the true equinox of the date; in column λ′ to the mean equinox of January 0ᵈ.0.

Diff. for 1 Hour,
—9ˢ.8296.
(Table II.)

GREENWICH MEAN TIME.

THE MOON'S

Day of the Month.	SEMIDIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
	′ ″	′ ″	′ ″	″	′ ″	″	h m	m	d
1	15 32.7	15 25.8	56 57.1	− 2.17	56 31.5	− 2.08	16 17.3	2.15	18.4
2	15 19.2	15 13.0	56 7.2	1.96	55 44.6	1.80	17 6.6	1.97	19.4
3	15 7.3	15 2.4	55 24.0	1.63	55 5.6	1.44	17 52.0	1.82	20.4
4	14 58.0	14 54.3	54 49.6	− 1.23	54 36.1	− 1.01	18 34.5	1.72	21.4
5	14 51.4	14 49.1	54 25.2	0.80	54 16.9	0.58	19 15.0	1.66	22.4
6	14 47.6	14 46.7	54 11.2	− 0.37	54 8.1	− 0.16	19 54.6	1.65	23.4
7	14 46.5	14 46.9	54 7.3	+ 0.03	54 8.9	+ 0.22	20 34.6	1.68	24.4
8	14 48.0	14 49.5	54 12.7	0.40	54 18.4	0.55	21 15.8	1.76	25.4
9	14 51.5	14 54.1	54 26.0	0.69	54 35.2	0.83	21 59.3	1.87	26.4
10	14 57.0	15 0.2	54 45.8	+ 0.94	54 57.6	+ 1.02	22 45.9	2.01	27.4
11	15 3.7	15 7.4	55 10.4	1.10	55 24.0	1.15	23 35.8	2.15	28.4
12	15 11.2	15 15.2	55 38.1	1.19	55 52.6	1.22	ó	. . .	29.4
13	15 19.2	15 23.2	56 7.3	+ 1.23	56 22.1	+ 1.23	0 29.0	2.27	0.7
14	15 27.2	15 31.2	56 36.9	1.22	56 51.5	1.21	1 24.5	2.34	1.7
15	15 35.1	15 39.0	57 5.9	1.19	57 20.0	1.17	2 20.7	2.33	2.7
16	15 42.8	15 46.4	57 33.9	+ 1.14	57 47.4	+ 1.11	3 16.0	2.27	3.7
17	15 50.0	15 53.5	58 0.6	1.09	58 13.5	1.06	4 9.5	2.18	4.7
18	15 56.9	16 0.2	58 25.9	1.02	58 38.0	0.98	5 0.8	2.09	5.7
19	16 3.3	16 6.3	58 49.5	+ 0.93	59 0.4	+ 0.87	5 50.3	2.04	6.7
20	16 9.1	16 11.5	59 10.5	0.80	59 19.6	0.71	6 38.9	2.03	7.7
21	16 13.7	16 15.4	59 27.5	0.60	59 33.9	0.46	7 27.9	2.07	8.7
22	16 16.7	16 17.5	59 38.6	+ 0.31	59 41.4	+ 0.14	8 18.4	2.15	9.7
23	16 17.6	16 17.1	59 41.9	− 0.05	59 40.1	− 0.26	9 11.6	2.28	10.7
24	16 15.9	16 13.9	59 35.6	0.48	59 28.5	0.70	10 7.9	2.41	11.7
25	16 11.3	16 7.9	59 18.6	− 0.93	59 6.2	− 1.14	11 7.0	2.50	12.7
26	16 3.8	15 59.2	58 51.3	1.34	58 34.2	1.50	12 7.4	2.52	13.7
27	15 54.0	15 48.3	58 15.2	1.66	57 54.6	1.75	13 6.9	2.43	14.7
28	15 42.5	15 36.5	57 33.1	− 1.81	57 10.8	− 1.86	14 3.5	2.28	15.7
29	15 30.4	15 24.3	56 48.4	1.86	56 26.2	1.82	14 56.0	2.09	16.7
30	15 18.5	15 13.0	56 4.8	1.75	55 44.4	1.64	15 44.1	1.92	17.7
31	15 7.7	15 3.1	55 25.4	1.51	55 8.2	1.35	16 28.5	1.79	18.7
32	14 58.9	14 55.4	54 53.0	− 1.17	54 40.0	− 0.98	17 10.3	1.70	19.7

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	WEDNESDAY 1.					FRIDAY 3.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	8 21 25.63	2.3482	N.23 55 11.1	5.846	0	10 6 18.28	2.0291	N.17 13 54.5	10.389
1	8 23 46.32	2.3415	23 49 16.6	5.971	1	10 8 19.85	2.0232	17 3 29.2	10.453
2	8 26 6.61	2.3347	23 43 14.6	6.095	2	10 10 21.06	2.0174	16 53 0.0	10.517
3	8 28 26.49	2.3279	23 37 5.2	6.217	3	10 12 21.93	2.0117	16 42 27.0	10.581
4	8 30 45.96	2.3212	23 30 48.5	6.338	4	10 14 22.46	2.0060	16 31 50.3	10.642
5	8 33 5.02	2.3143	23 24 24.6	6.457	5	10 16 22.65	2.0004	16 21 9.9	10.703
6	8 35 23.67	2.3073	23 17 53.6	6.576	6	10 18 22.51	1.9948	16 10 25.9	10.762
7	8 37 41.91	2.3005	23 11 15.5	6.694	7	10 20 22.03	1.9893	15 59 38.4	10.822
8	8 39 59.74	2.2937	23 4 30.4	6.810	8	10 22 21.23	1.9839	15 48 47.3	10.880
9	8 42 17.15	2.2867	22 57 38.3	6.924	9	10 24 20.10	1.9785	15 37 52.8	10.937
10	8 44 34.14	2.2797	22 50 39.4	7.037	10	10 26 18.65	1.9732	15 26 54.9	10.992
11	8 46 50.72	2.2728	22 43 33.8	7.149	11	10 28 16.88	1.9679	15 15 53.7	11.047
12	8 49 6.88	2.2658	22 36 21.5	7.260	12	10 30 14.80	1.9627	15 4 49.2	11.102
13	8 51 22.62	2.2589	22 29 2.6	7.368	13	10 32 12.41	1.9577	14 53 41.5	11.154
14	8 53 37.95	2.2520	22 21 37.3	7.476	14	10 34 9.72	1.9526	14 42 30.7	11.206
15	8 55 52.86	2.2451	22 14 5.5	7.583	15	10 36 6.72	1.9475	14 31 16.8	11.257
16	8 58 7.36	2.2382	22 6 27.3	7.688	16	10 38 3.42	1.9426	14 19 59.8	11.308
17	9 0 21.44	2.2312	21 58 42.9	7.792	17	10 39 59.83	1.9377	14 8 39.8	11.357
18	9 2 35.10	2.2242	21 50 52.3	7.894	18	10 41 55.95	1.9329	13 57 16.9	11.405
19	9 4 48.34	2.2172	21 42 55.6	7.995	19	10 43 51.78	1.9281	13 45 51.2	11.452
20	9 7 1.17	2.2104	21 34 52.9	8.095	20	10 45 47.32	1.9234	13 34 22.6	11.499
21	9 9 13.59	2.2036	21 26 44.2	8.194	21	10 47 42.59	1.9188	13 22 51.3	11.544
22	9 11 25.60	2.1967	21 18 29.6	8.292	22	10 49 37.58	1.9142	13 11 17.3	11.589
23	9 13 37.20	2.1898	N.21 10 9.2	8.387	23	10 51 32.30	1.9098	N.12 59 40.6	11.633
	THURSDAY 2.					SATURDAY 4.			
0	9 15 48.38	2.1829	N.21 1 43.1	8.482	0	10 53 26.76	1.9054	N.12 48 1.3	11.677
1	9 17 59.15	2.1762	20 53 11.4	8.575	1	10 55 20.95	1.9010	12 36 19.4	11.718
2	9 20 9.52	2.1694	20 44 34.1	8.667	2	10 57 14.88	1.8967	12 24 35.1	11.759
3	9 22 19.48	2.1627	20 35 51.3	8.758	3	10 59 8.56	1.8926	12 12 48.3	11.800
4	9 24 29.04	2.1559	20 27 3.1	8.848	4	11 1 1.99	1.8884	12 0 59.1	11.840
5	9 26 38.19	2.1492	20 18 9.5	8.937	5	11 2 55.17	1.8843	11 49 7.5	11.879
6	9 28 46.94	2.1425	20 9 10.7	9.023	6	11 4 48.11	1.8803	11 37 13.6	11.917
7	9 30 55.29	2.1358	20 0 6.7	9.109	7	11 6 40.81	1.8764	11 25 17.5	11.953
8	9 33 3.24	2.1292	19 50 57.6	9.194	8	11 8 33.28	1.8726	11 13 19.2	11.990
9	9 35 10.80	2.1227	19 41 43.4	9.277	9	11 10 25.52	1.8687	11 1 18.7	12.026
10	9 37 17.96	2.1161	19 32 24.3	9.359	10	11 12 17.53	1.8650	10 49 16.1	12.060
11	9 39 24.73	2.1096	19 23 0.3	9.441	11	11 14 9.32	1.8614	10 37 11.5	12.093
12	9 41 31.11	2.1031	19 13 31.5	9.521	12	11 16 0.90	1.8578	10 25 4.9	12.127
13	9 43 37.10	2.0967	19 3 57.9	9.598	13	11 17 52.26	1.8543	10 12 56.3	12.160
14	9 45 42.71	2.0903	18 54 19.6	9.676	14	11 19 43.42	1.8510	10 0 45.7	12.192
15	9 47 47.94	2.0840	18 44 36.7	9.752	15	11 21 34.38	1.8476	9 48 33.3	12.222
16	9 49 52.79	2.0777	18 34 49.3	9.827	16	11 23 25.13	1.8442	9 36 19.1	12.252
17	9 51 57.27	2.0715	18 24 57.4	9.902	17	11 25 15.69	1.8410	9 24 3.1	12.282
18	9 54 1.37	2.0652	18 15 1.1	9.975	18	11 27 6.05	1.8378	9 11 45.3	12.311
19	9 56 5.10	2.0591	18 5 0.4	10.047	19	11 28 56.23	1.8348	8 59 25.8	12.338
20	9 58 8.46	2.0529	17 54 55.5	10.117	20	11 30 46.23	1.8318	8 47 4.7	12.366
21	10 0 11.45	2.0469	17 44 46.4	10.187	21	11 32 36.05	1.8289	8 34 41.9	12. 92
22	10 2 14.08	2.0409	17 34 33.1	10.255	22	11 34 25.70	1.8260	8 22 17.6	12.417
23	10 4 16.36	2.0349	17 24 15.8	10.322	23	11 36 15.17	1.8232	8 9 51.8	12.442
24	10 6 18.28	2.0291	N.17 13 54.5	10.389	24	11 38 4.48	1.8205	N. 7 57 24.5	12.467

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	SUNDAY 5.					TUESDAY 7.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	11 38 4.48	1.8205	N. 7 57 24.5	12.467	0	13 3 41.07	1.7738	S. 2 16 28.7	12.867
1	11 39 53.63	1.8178	7 44 55.8	12.490	1	13 5 27.52	1.7746	2 29 20.5	12.859
2	11 41 42.62	1.8153	7 32 25.7	12.513	2	13 7 14.02	1.7754	2 42 11.8	12.852
3	11 43 31.47	1.8128	7 19 54.2	12.536	3	13 9 0.57	1.7763	2 55 2.7	12.844
4	11 45 20.16	1.8103	7 7 21.4	12.557	4	13 10 47.18	1.7773	3 7 53.1	12.834
5	11 47 8.71	1.8080	6 54 47.3	12.578	5	13 12 33.85	1.7783	3 20 42.8	12.824
6	11 48 57.12	1.8057	6 42 12.0	12.598	6	13 14 20.58	1.7793	3 33 32.0	12.814
7	11 50 45.39	1.8034	6 29 35.5	12.618	7	13 16 7.37	1.7805	3 46 20.5	12.803
8	11 52 33.53	1.8013	6 16 57.8	12.637	8	13 17 54.24	1.7817	3 59 8.4	12.792
9	11 54 21.55	1.7992	6 4 19.0	12.655	9	13 19 41.18	1.7830	4 11 55.5	12.778
10	11 56 9.44	1.7972	5 51 39.2	12.672	10	13 21 28.20	1.7844	4 24 41.8	12.766
11	11 57 57.21	1.7952	5 38 58.3	12.689	11	13 23 15.31	1.7858	4 37 27.4	12.752
12	11 59 44.87	1.7934	5 26 16.5	12.705	12	13 25 2.50	1.7873	4 50 12.1	12.737
13	12 1 32.42	1.7917	5 13 33.7	12.722	13	13 26 49.79	1.7889	5 2 55.9	12.722
14	12 3 19.87	1.7900	5 0 49.9	12.737	14	13 28 37.17	1.7905	5 15 38.8	12.707
15	12 5 7.22	1.7883	4 48 5.3	12.750	15	13 30 24.65	1.7922	5 28 20.8	12.691
16	12 6 54.47	1.7867	4 35 19.9	12.764	16	13 32 12.23	1.7939	5 41 1.7	12.673
17	12 8 41.63	1.7852	4 22 33.6	12.777	17	13 33 59.92	1.7958	5 53 41.6	12.656
18	12 10 28.70	1.7838	4 9 46.6	12.789	18	13 35 47.73	1.7977	6 6 20.4	12.637
19	12 12 15.69	1.7824	3 56 58.9	12.801	19	13 37 35.65	1.7996	6 18 58.1	12.618
20	12 14 2.59	1.7811	3 44 10.5	12.812	20	13 39 23.68	1.8016	6 31 34.6	12.598
21	12 15 49.42	1.7799	3 31 21.4	12.823	21	13 41 11.84	1.8037	6 44 9.9	12.578
22	12 17 36.18	1.7788	3 18 31.7	12.832	22	13 43 0.13	1.8059	6 56 44.0	12.557
23	12 19 22.88	1.7777	N. 3 5 41.5	12.841	23	13 44 48.55	1.8082	S. 7 9 16.7	12.534
	MONDAY 6.					WEDNESDAY 8.			
0	12 21 9.51	1.7767	N. 2 52 50.8	12.850	0	13 46 37.11	1.8104	S. 7 21 48.1	12.512
1	12 22 56.09	1.7758	2 39 59.5	12.858	1	13 48 25.80	1.8127	7 34 18.1	12.488
2	12 24 42.61	1.7749	2 27 7.8	12.865	2	13 50 14.64	1.8152	7 46 46.7	12.464
3	12 26 29.08	1.7742	2 14 15.7	12.872	3	13 52 3.63	1.8177	7 59 13.8	12.439
4	12 28 15.51	1.7734	2 1 23.2	12.877	4	13 53 52.76	1.8202	8 11 39.4	12.414
5	12 30 1.89	1.7727	1 48 30.4	12.883	5	13 55 42.05	1.8228	8 24 3.5	12.387
6	12 31 48.24	1.7722	1 35 37.2	12.888	6	13 57 31.50	1.8255	8 36 25.9	12.360
7	12 33 34.56	1.7717	1 22 43.8	12.892	7	13 59 21.11	1.8282	8 48 46.7	12.332
8	12 35 20.85	1.7712	1 9 50.2	12.895	8	14 1 10.88	1.8310	9 1 5.8	12.304
9	12 37 7.11	1.7708	0 56 56.4	12.898	9	14 3 0.83	1.8339	9 13 23.2	12.274
10	12 38 53.35	1.7706	0 44 2.4	12.901	10	14 4 50.95	1.8367	9 25 38.7	12.243
11	12 40 39.58	1.7704	0 31 8.3	12.902	11	14 6 41.24	1.8397	9 37 52.4	12.213
12	12 42 25.80	1.7702	0 18 14.1	12.903	12	14 8 31.72	1.8428	9 50 4.3	12.182
13	12 44 12.01	1.7702	N. 0 5 19.9	12.904	13	14 10 22.38	1.8459	10 2 14.2	12.149
14	12 45 58.22	1.7702	S. 0 7 34.4	12.904	14	14 12 13.23	1.8491	10 14 22.2	12.116
15	12 47 44.43	1.7702	0 20 28.6	12.902	15	14 14 4.27	1.8522	10 26 28.1	12.081
16	12 49 30.64	1.7703	0 33 22.7	12.901	16	14 15 55.50	1.8555	10 38 31.9	12.046
17	12 51 16.87	1.7706	0 46 16.7	12.899	17	14 17 46.93	1.8588	10 50 33.6	12.011
18	12 53 3.11	1.7708	0 59 10.6	12.897	18	14 19 38.56	1.8622	11 2 33.2	11.974
19	12 54 49.36	1.7711	1 12 4.3	12.893	19	14 21 30.40	1.8657	11 14 30.5	11.937
20	12 56 35.64	1.7716	1 24 57.8	12.889	20	14 23 22.45	1.8692	11 26 25.6	11.898
21	12 58 21.95	1.7721	1 37 51.0	12.884	21	14 25 14.71	1.8727	11 38 18.3	11.859
22	13 0 8.29	1.7726	1 50 43.9	12.879	22	14 27 7.18	1.8764	11 50 8.7	11.819
23	13 1 54.66	1.7732	2 3 36.5	12.873	23	14 28 59.88	1.8802	12 1 56.6	11.778
24	13 3 41.07	1.7738	S. 2 16 28.7	12.867	24	14 30 52.80	1.8838	S. 12 13 42.1	11.737

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	THURSDAY 9.					SATURDAY 11.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	14 30 52.80	1.8838	S.12 13 42.1	11.737	0	16 6 31.00	2.1149	S.20 31 23.1	8.613
1	14 32 45.94	1.8877	12 25 25.1	11.695	1	16 8 38.06	2.1204	20 39 57.2	8.523
2	14 34 39.32	1.8916	12 37 5.5	11.651	2	16 10 45.45	2.1259	20 48 25.9	8.432
3	14 36 32.93	1.8954	12 48 43.2	11.607	3	16 12 53.17	2.1314	20 56 49.0	8.338
4	14 38 26.77	1.8993	13 0 18.3	11.562	4	16 15 1.22	2.1369	21 5 6.5	8.244
5	14 40 20.85	1.9033	13 11 50.7	11.516	5	16 17 9.60	2.1423	21 13 18.3	8.149
6	14 42 15.17	1.9074	13 23 20.3	11.469	6	16 19 18.30	2.1478	21 21 24.4	8.053
7	14 44 9.74	1.9116	13 34 47.0	11.422	7	16 21 27.34	2.1534	21 29 24.7	7.956
8	14 46 4.56	1.9157	13 46 10.8	11.373	8	16 23 36.71	2.1588	21 37 19.1	7.857
9	14 47 59.63	1.9200	13 57 31.7	11.322	9	16 25 46.40	2.1642	21 45 7.6	7.758
10	14 49 54.96	1.9242	14 8 49.5	11.272	10	16 27 56.42	2.1697	21 52 50.1	7.657
11	14 51 50.54	1.9286	14 20 4.3	11.221	11	16 30 6.77	2.1752	22 0 26.5	7.556
12	14 53 46.39	1.9330	14 31 16.0	11.168	12	16 32 17.44	2.1806	22 7 56.8	7.453
13	14 55 42.50	1.9373	14 42 24.5	11.115	13	16 34 28.44	2.1860	22 15 20.9	7.349
14	14 57 38.87	1.9417	14 53 29.8	11.061	14	16 36 39.76	2.1914	22 22 38.7	7.244
15	14 59 35.51	1.9463	15 4 31.8	11.006	15	16 38 51.41	2.1969	22 29 50.2	7.138
16	15 1 32.43	1.9509	15 15 30.5	10.950	16	16 41 3.39	2.2022	22 36 55.3	7.032
17	15 3 29.62	1.9554	15 26 25.8	10.892	17	16 43 15.68	2.2075	22 43 54.0	6.923
18	15 5 27.08	1.9601	15 37 17.6	10.834	18	16 45 28.29	2.2128	22 50 46.1	6.813
19	15 7 24.83	1.9648	15 48 5.9	10.775	19	16 47 41.22	2.2182	22 57 31.6	6.703
20	15 9 22.86	1.9696	15 58 50.6	10.715	20	16 49 54.47	2.2234	23 4 10.5	6.592
21	15 11 21.18	1.9743	16 9 31.7	10.654	21	16 52 8.03	2.2287	23 10 42.7	6.480
22	15 13 19.78	1.9791	16 20 9.1	10.592	22	16 54 21.90	2.2338	23 17 8.1	6.367
23	15 15 18.67	1.9840	S.16 30 42.7	10.528	23	16 56 36.09	2.2390	S.23 23 26.7	6.252
	FRIDAY 10.					SUNDAY 12.			
0	15 17 17.86	1.9889	S.16 41 12.5	10.465	0	16 58 50.59	2.2442	S.23 29 38.3	6.136
1	15 19 17.34	1.9938	16 51 38.5	10.400	1	17 1 5.39	2.2492	23 35 43.0	6.019
2	15 21 17.12	1.9988	17 2 0.5	10.333	2	17 3 20.50	2.2543	23 41 40.6	5.901
3	15 23 17.20	2.0037	17 12 18.5	10.267	3	17 5 35.91	2.2594	23 47 31.1	5.782
4	15 25 17.57	2.0087	17 22 32.5	10.198	4	17 7 51.63	2.2644	23 53 14.4	5.662
5	15 27 18.25	2.0139	17 32 42.3	10.129	5	17 10 7.64	2.2692	23 58 50.6	5.542
6	15 29 19.24	2.0190	17 42 48.0	10.060	6	17 12 23.94	2.2741	24 4 19.5	5.420
7	15 31 20.53	2.0241	17 52 49.5	9.988	7	17 14 40.53	2.2790	24 9 41.0	5.297
8	15 33 22.13	2.0293	18 2 46.6	9.915	8	17 16 57.42	2.2838	24 14 55.2	5.174
9	15 35 24.05	2.0346	18 12 39.3	9.842	9	17 19 14.59	2.2885	24 20 1.9	5.049
10	15 37 26.28	2.0397	18 22 27.7	9.768	10	17 21 32.04	2.2932	24 25 1.1	4.923
11	15 39 28.82	2.0449	18 32 11.5	9.692	11	17 23 49.77	2.2977	24 29 52.7	4.797
12	15 41 31.67	2.0502	18 41 50.8	9.617	12	17 26 7.77	2.3023	24 34 36.7	4.669
13	15 43 34.84	2.0555	18 51 25.5	9.539	13	17 28 26.05	2.3068	24 39 13.0	4.541
14	15 45 38.33	2.0608	19 0 55.5	9.460	14	17 30 44.59	2.3113	24 43 41.6	4.412
15	15 47 42.14	2.0662	19 10 20.7	9.380	15	17 33 3.40	2.3157	24 48 2.5	4.282
16	15 49 46.27	2.0716	19 19 41.1	9.299	16	17 35 22.47	2.3199	24 52 15.5	4.151
17	15 51 50.72	2.0769	19 28 56.6	9.217	17	17 37 41.79	2.3241	24 56 20.6	4.018
18	15 53 55.50	2.0822	19 38 7.2	9.134	18	17 40 1.36	2.3282	25 0 17.7	3.886
19	15 56 0.60	2.0877	19 47 12.7	9.050	19	17 42 21.18	2.3324	25 4 6.9	3.752
20	15 58 6.03	2.0932	19 56 13.2	8.966	20	17 44 41.25	2.3364	25 7 48.0	3.617
21	16 0 11.78	2.0986	20 5 8.6	8.879	21	17 47 1.55	2.3403	25 11 21.0	3.482
22	16 2 17.86	2.1041	20 13 58.7	8.792	22	17 49 22.09	2.3442	25 14 45.9	3.347
23	16 4 24.27	2.1095	20 22 43.6	8.703	23	17 51 42.85	2.3479	25 18 2.6	3.209
24	16 6 31.00	2.1149	S.20 31 23.1	8.613	24	17 54 3.84	2.3517	S.25 21 11.0	3.072

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	MONDAY 13.					WEDNESDAY 15.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	17 54 3.84	2.3517	S. 25 21 11.0	3.072	0	19 49 23.37	2.4142	S. 25 0 27.9	4.023
1	17 56 25.05	2.3553	25 24 11.2	2.933	1	19 51 48.19	2.4130	24 56 22.0	4.172
2	17 58 46.47	2.3587	25 27 3.0	2.794	2	19 54 12.93	2.4117	24 52 7.3	4.319
3	18 1 8.10	2.3622	25 29 46.5	2.654	3	19 56 37.59	2.4103	24 47 43.7	4.467
4	18 3 29.94	2.3656	25 32 21.5	2.513	4	19 59 2.17	2.4089	24 43 11.2	4.615
5	18 5 51.97	2.3688	25 34 48.1	2.373	5	20 1 26.66	2.4073	24 38 29.9	4.762
6	18 8 14.20	2.3721	25 37 6.3	2.232	6	20 3 51.05	2.4057	24 33 39.8	4.908
7	18 10 36.62	2.3752	25 39 15.9	2.088	7	20 6 15.34	2.4040	24 28 40.9	5.055
8	18 12 59.22	2.3781	25 41 16.9	1.946	8	20 8 39.53	2.4022	24 23 33.2	5.200
9	18 15 21.99	2.3810	25 43 9.4	1.802	9	20 11 3.61	2.4003	24 18 16.9	5.345
10	18 17 44.94	2.3838	25 44 53.2	1.657	10	20 13 27.57	2.3983	24 12 51.8	5.490
11	18 20 8.05	2.3865	25 46 28.3	1.512	11	20 15 51.41	2.3962	24 7 18.1	5.633
12	18 22 31.32	2.3892	25 47 54.7	1.367	12	20 18 15.12	2.3941	24 1 35.8	5.777
13	18 24 54.75	2.3917	25 49 12.4	1.222	13	20 20 38.70	2.3919	23 55 44.9	5.920
14	18 27 18.32	2.3941	25 50 21.3	1.076	14	20 23 2.15	2.3897	23 49 45.4	6.062
15	18 29 42.04	2.3964	25 51 21.5	0.929	15	20 25 25.46	2.3873	23 43 37.5	6.202
16	18 32 5.89	2.3986	25 52 12.8	0.782	16	20 27 48.63	2.3850	23 37 21.1	6.344
17	18 34 29.87	2.4007	25 52 55.3	0.634	17	20 30 11.66	2.3825	23 30 56.2	6.485
18	18 36 53.98	2.4027	25 53 28.9	0.486	18	20 32 34.53	2.3798	23 24 22.9	6.624
19	18 39 18.20	2.4046	25 53 53.6	0.337	19	20 34 57.24	2.3772	23 17 41.3	6.762
20	18 41 42.53	2.4064	25 54 9.4	0.188	20	20 37 19.80	2.3747	23 10 51.4	6.901
21	18 44 6.97	2.4082	25 54 16.2	−0.039	21	20 39 42.20	2.3719	23 3 53.2	7.038
22	18 46 31.51	2.4097	25 54 14.1	+0.109	22	20 42 4.43	2.3692	22 56 46.8	7.175
23	18 48 56.14	2.4112	S. 25 54 3.1	0.259	23	20 44 26.50	2.3663	S. 22 49 32.2	7.311
	TUESDAY 14.					THURSDAY 16.			
0	18 51 20.86	2.4127	S. 25 53 43.0	0.409	0	20 46 48.39	2.3634	S. 22 42 9.5	7.446
1	18 53 45.66	2.4139	25 53 14.0	0.559	1	20 49 10.11	2.3605	22 34 38.7	7.579
2	18 56 10.53	2.4150	25 52 35.9	0.710	2	20 51 31.65	2.3574	22 27 0.0	7.712
3	18 58 35.46	2.4161	25 51 48.8	0.861	3	20 53 53.00	2.3543	22 19 13.3	7.845
4	19 1 0.46	2.4171	25 50 52.6	1.012	4	20 56 14.17	2.3513	22 11 18.6	7.977
5	19 3 25.51	2.4178	25 49 47.4	1.162	5	20 58 35.16	2.3482	22 3 16.0	8.108
6	19 5 50.60	2.4186	25 48 33.1	1.313	6	21 0 55.96	2.3451	21 55 5.7	8.237
7	19 8 15.74	2.4193	25 47 9.8	1.464	7	21 3 16.57	2.3418	21 46 47.6	8.367
8	19 10 40.92	2.4198	25 45 37.4	1.615	8	21 5 36.98	2.3386	21 38 21.7	8.495
9	19 13 6.12	2.4203	25 43 56.0	1.766	9	21 7 57.20	2.3353	21 29 48.2	8.622
10	19 15 31.35	2.4207	25 42 5.5	1.917	10	21 10 17.22	2.3320	21 21 7.1	8.748
11	19 17 56.60	2.4208	25 40 5.9	2.069	11	21 12 37.04	2.3287	21 12 18.4	8.873
12	19 20 21.85	2.4209	25 37 57.2	2.221	12	21 14 56.66	2.3253	21 3 22.3	8.997
13	19 22 47.11	2.4209	25 35 39.4	2.372	13	21 17 16.08	2.3219	20 54 18.7	9.121
14	19 25 12.36	2.4207	25 33 12.6	2.522	14	21 19 35.29	2.3184	20 45 7.8	9.242
15	19 27 37.60	2.4206	25 30 36.8	2.672	15	21 21 54.29	2.3150	20 35 49.6	9.364
16	19 30 2.83	2.4203	25 27 51.9	2.824	16	21 24 13.09	2.3116	20 26 24.1	9.485
17	19 32 28.04	2.4199	25 24 57.9	2.975	17	21 26 31.68	2.3082	20 16 51.4	9.604
18	19 34 53.22	2.4193	25 21 54.9	3.125	18	21 28 50.07	2.3047	20 7 11.6	9.722
19	19 37 18.36	2.4187	25 18 42.9	3.276	19	21 31 8.24	2.3011	19 57 24.8	9.839
20	19 39 43.47	2.4181	25 15 21.8	3.426	20	21 33 26.20	2.2976	19 47 30.9	9.956
21	19 42 8.53	2.4172	25 11 51.8	3.575	21	21 35 43.95	2.2941	19 37 30.1	10.071
22	19 44 33.53	2.4162	25 8 12.8	3.725	22	21 38 1.49	2.2905	19 27 22.4	10.185
23	19 46 58.48	2.4153	25 4 24.8	3.874	23	21 40 18.81	2.2870	19 17 7.9	10.298
24	19 49 23.37	2.4142	S. 25 0 27.9	4.023	24	21 42 35.93	2.2835	S. 19 6 46.6	10.410

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	FRIDAY 17.					SUNDAY 19.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	21 42 35.93	2.2835	S. 19 6 46.6	10.410	0	23 28 29.80	2.1436	S. 9 0 5.5	14.407
1	21 44 52.83	2.2799	18 56 18.7	10.521	1	23 30 38.36	2.1418	8 45 39.5	14.459
2	21 47 9.52	2.2763	18 45 44.1	10.631	2	23 32 46.82	2.1402	8 31 10.4	14.512
3	21 49 25.99	2.2728	18 35 3.0	10.738	3	23 34 55.19	2.1387	8 16 38.2	14.562
4	21 51 42.26	2.2693	18 24 15.5	10.846	4	23 37 3.46	2.1371	8 2 3.0	14.612
5	21 53 58.31	2.2657	18 13 21.5	10.952	5	23 39 11.64	2.1357	7 47 24.8	14.660
6	21 56 14.15	2.2622	18 2 21.2	11.058	6	23 41 19.74	2.1343	7 32 43.8	14.706
7	21 58 29.78	2.2587	17 51 14.5	11.162	7	23 43 27.76	2.1330	7 18 0.0	14.752
8	22 0 45.20	2.2552	17 40 1.7	11.265	8	23 45 35.70	2.1317	7 3 13.5	14.797
9	22 3 0.41	2.2518	17 28 42.7	11.367	9	23 47 43.56	2.1305	6 48 24.4	14.839
10	22 5 15.42	2.2484	17 17 17.6	11.468	10	23 49 51.36	2.1294	6 33 32.8	14.881
11	22 7 30.22	2.2449	17 5 46.5	11.567	11	23 51 59.09	2.1284	6 18 38.7	14.922
12	22 9 44.81	2.2415	16 54 9.5	11.666	12	23 54 6.77	2.1275	6 3 42.2	14.962
13	22 11 59.20	2.2381	16 42 26.6	11.763	13	23 56 14.39	2.1266	5 48 43.4	14.998
14	22 14 13.38	2.2347	16 30 37.9	11.859	14	23 58 21.96	2.1257	5 33 42.4	15.034
15	22 16 27.36	2.2313	16 18 43.5	11.953	15	0 0 29.48	2.1250	5 18 39.3	15.069
16	22 18 41.14	2.2280	16 6 43.5	12.047	16	0 2 36.96	2.1243	5 3 34.1	15.104
17	22 20 54.72	2.2247	15 54 37.8	12.141	17	0 4 44.40	2.1237	4 48 26.9	15.137
18	22 23 8.10	2.2214	15 42 26.6	12.232	18	0 6 51.81	2.1232	4 33 17.7	15.167
19	22 25 21.29	2.2182	15 30 10.0	12.322	19	0 8 59.19	2.1227	4 18 6.7	15.197
20	22 27 34.29	2.2150	15 17 48.0	12.411	20	0 11 6.55	2.1224	4 2 54.0	15.226
21	22 29 47.09	2.2118	15 5 20.7	12.499	21	0 13 13.89	2.1222	3 47 39.6	15.253
22	22 31 59.70	2.2087	14 52 48.1	12.586	22	0 15 21.21	2.1220	3 32 23.6	15.280
23	22 34 12.13	2.2056	S. 14 40 10.4	12.671	23	0 17 28.52	2.1218	S. 3 17 6.0	15.305
	SATURDAY 18.					MONDAY 20.			
0	22 36 24.37	2.2025	S. 14 27 27.6	12.755	0	0 19 35.83	2.1218	S. 3 1 47.0	15.327
1	22 38 36.43	2.1994	14 14 39.8	12.837	1	0 21 43.14	2.1218	2 46 26.7	15.349
2	22 40 48.30	2.1964	14 1 47.1	12.919	2	0 23 50.45	2.1219	2 31 5.1	15.370
3	22 43 0.00	2.1935	13 48 49.5	13.000	3	0 25 57.77	2.1222	2 15 42.3	15.390
4	22 45 11.52	2.1906	13 35 47.1	13.080	4	0 28 5.10	2.1224	2 0 18.3	15.408
5	22 47 22.87	2.1877	13 22 39.9	13.157	5	0 30 12.45	2.1227	1 44 53.3	15.424
6	22 49 34.05	2.1850	13 9 28.1	13.233	6	0 32 19.83	2.1232	1 29 27.4	15.439
7	22 51 45.07	2.1822	12 56 11.8	13.309	7	0 34 27.24	2.1237	1 14 0.6	15.453
8	22 53 55.92	2.1795	12 42 51.0	13.384	8	0 36 34.68	2.1242	0 58 33.0	15.466
9	22 56 6.61	2.1768	12 29 25.7	13.458	9	0 38 42.15	2.1249	0 43 4.7	15.477
10	22 58 17.14	2.1742	12 15 56.0	13.530	10	0 40 49.67	2.1257	0 27 35.8	15.487
11	23 0 27.51	2.1716	12 2 22.1	13.600	11	0 42 57.23	2.1264	S. 0 12 6.3	15.496
12	23 2 37.73	2.1691	11 48 44.0	13.670	12	0 45 4.84	2.1273	N. 0 3 23.7	15.502
13	23 4 47.80	2.1667	11 35 1.7	13.738	13	0 47 12.51	2.1283	0 18 54.0	15.507
14	23 6 57.73	2.1643	11 21 15.4	13.805	14	0 49 20.24	2.1293	0 34 24.6	15.512
15	23 9 7.52	2.1620	11 7 25.1	13.871	15	0 51 28.03	2.1305	0 49 55.5	15.516
16	23 11 17.17	2.1597	10 53 30.9	13.935	16	0 53 35.90	2.1317	1 5 26.5	15.517
17	23 13 26.68	2.1574	10 39 32.9	13.998	17	0 55 43.84	2.1330	1 20 57.5	15.517
18	23 15 36.06	2.1553	10 25 31.1	14.061	18	0 57 51.86	2.1344	1 36 28.5	15.515
19	23 17 45.32	2.1532	10 11 25.6	14.122	19	0 59 59.97	2.1358	1 51 59.3	15.512
20	23 19 54.45	2.1512	9 57 16.5	14.181	20	1 2 8.16	2.1373	2 7 29.9	15.508
21	23 22 3.46	2.1492	9 43 3.9	14.239	21	1 4 16.45	2.1390	2 23 0.2	15.502
22	23 24 12.35	2.1472	9 28 47.8	14.297	22	1 6 24.84	2.1407	2 38 30.2	15.495
23	23 26 21.13	2.1454	9 14 28.3	14.352	23	1 8 33.33	2.1424	2 53 59.7	15.487
24	23 28 29.80	2.1436	S. 9 0 5.5	14.407	24	1 10 41.93	2.1443	N. 3 9 28.7	15.477

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	TUESDAY 21.					THURSDAY 23.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	1 10 41.93	2.1443	N. 3 9 28.7	15.477	0	2 57 8.22	2.3147	N.14 52 5.4	13.190
1	1 12 50.65	2.1462	3 24 57.0	15.466	1	2 59 27.24	2.3195	15 5 14.2	13.102
2	1 14 59.48	2.1482	3 40 24.6	15.453	2	3 1 46.56	2.3244	15 18 17.7	13.013
3	1 17 8.44	2.1503	3 55 51.4	15.439	3	3 4 6.17	2.3292	15 31 15.8	12.922
4	1 19 17.52	2.1525	4 11 17.3	15.423	4	3 6 26.07	2.3342	15 44 8.4	12.830
5	1 21 26.74	2.1548	4 26 42.2	15.406	5	3 8 46.27	2.3392	15 56 55.4	12.736
6	1 23 36.09	2.1570	4 42 6.0	15.387	6	3 11 6.77	2.3442	16 9 36.7	12.640
7	1 25 45.58	2.1594	4 57 28.6	15.367	7	3 13 27.57	2.3491	16 22 12.2	12.543
8	1 27 55.22	2.1619	5 12 50.0	15.345	8	3 15 48.66	2.3541	16 34 41.9	12.445
9	1 30 5.01	2.1645	5 28 10.0	15.322	9	3 18 10.06	2.3591	16 47 5.6	12.344
10	1 32 14.96	2.1671	5 43 28.6	15.297	10	3 20 31.75	2.3641	16 59 23.2	12.242
11	1 34 25.06	2.1698	5 58 45.7	15.272	11	3 22 53.75	2.3692	17 11 34.6	12.137
12	1 36 35.33	2.1726	6 14 1.2	15.243	12	3 25 16.05	2.3742	17 23 39.7	12.032
13	1 38 45.77	2.1754	6 29 14.9	15.214	13	3 27 38.65	2.3792	17 35 38.5	11.926
14	1 40 56.38	2.1782	6 44 26.9	15.184	14	3 30 1.56	2.3843	17 47 30.8	11.817
15	1 43 7.16	2.1812	6 59 37.0	15.151	15	3 32 24.77	2.3893	17 59 16.5	11.706
16	1 45 18.13	2.1844	7 14 45.0	15.117	16	3 34 48.28	2.3943	18 10 55.5	11.594
17	1 47 29.29	2.1875	7 29 51.0	15.082	17	3 37 12.09	2.3993	18 22 27.8	11.481
18	1 49 40.63	2.1907	7 44 54.8	15.045	18	3 39 36.20	2.4044	18 33 53.2	11.366
19	1 51 52.17	2.1940	7 59 56.4	15.007	19	3 42 0.62	2.4094	18 45 11.7	11.249
20	1 54 3.91	2.1973	8 14 55.6	14.966	20	3 44 25.33	2.4144	18 56 23.1	11.130
21	1 56 15.85	2.2007	8 29 52.3	14.924	21	3 46 50.35	2.4194	19 7 27.3	11.011
22	1 58 28.00	2.2042	8 44 46.5	14.881	22	3 49 15.66	2.4243	19 18 24.4	10.890
23	2 0 40.36	2.2078	N. 8 59 38.0	14.836	23	3 51 41.27	2.4292	N.19 29 14.1	10.767
	WEDNESDAY 22.					FRIDAY 24.			
0	2 2 52.94	2.2114	N. 9 14 26.8	14.790	0	3 54 7.17	2.4342	N.19 39 56.4	10.642
1	2 5 5.73	2.2150	9 29 12.8	14.742	1	3 56 33.37	2.4391	19 50 31.2	10.517
2	2 7 18.74	2.2187	9 43 55.8	14.692	2	3 58 59.86	2.4439	20 0 58.4	10.389
3	2 9 31.98	2.2226	9 58 35.8	14.641	3	4 1 26.64	2.4487	20 11 17.9	10.260
4	2 11 45.45	2.2265	10 13 12.7	14.588	4	4 3 53.71	2.4535	20 21 29.6	10.129
5	2 13 59.16	2.2304	10 27 46.4	14.533	5	4 6 21.06	2.4582	20 31 33.4	9.997
6	2 16 13.10	2.2343	10 42 16.7	14.477	6	4 8 48.70	2.4630	20 41 29.3	9.864
7	2 18 27.28	2.2383	10 56 43.7	14.420	7	4 11 16.62	2.4677	20 51 17.1	9.729
8	2 20 41.70	2.2424	11 11 7.1	14.361	8	4 13 44.82	2.4722	21 0 56.8	9.592
9	2 22 56.37	2.2467	11 25 27.0	14.301	9	4 16 13.29	2.4767	21 10 28.2	9.455
10	2 25 11.30	2.2509	11 39 43.2	14.237	10	4 18 42.03	2.4812	21 19 51.4	9.317
11	2 27 26.48	2.2551	11 53 55.5	14.173	11	4 21 11.04	2.4857	21 29 6.2	9.177
12	2 29 41.91	2.2593	12 8 4.0	14.108	12	4 23 40.32	2.4902	21 38 12.6	9.035
13	2 31 57.60	2.2637	12 22 8.5	14.040	13	4 26 9.86	2.4944	21 47 10.4	8.892
14	2 34 13.56	2.2682	12 36 8.8	13.970	14	4 28 39.65	2.4987	21 55 59.6	8.747
15	2 36 29.79	2.2727	12 50 4.9	13.900	15	4 31 9.70	2.5029	22 4 40.1	8.602
16	2 38 46.28	2.2772	13 3 56.8	13.828	16	4 33 40.00	2.5070	22 13 11.8	8.455
17	2 41 3.05	2.2817	13 17 44.3	13.754	17	4 36 10.54	2.5110	22 21 34.7	8.307
18	2 43 20.09	2.2862	13 31 27.3	13.678	18	4 38 41.32	2.5150	22 29 48.6	8.157
19	2 45 37.40	2.2909	13 45 5.7	13.601	19	4 41 12.34	2.5189	22 37 53.6	8.007
20	2 47 55.00	2.2957	13 58 39.4	13.522	20	4 43 43.59	2.5227	22 45 49.5	7.855
21	2 50 12.88	2.3003	14 12 8.3	13.442	21	4 46 15.06	2.5263	22 53 36.2	7.702
22	2 52 31.04	2.3050	14 25 32.4	13.359	22	4 48 46.75	2.5300	23 1 13.8	7.549
23	2 54 49.48	2.3098	14 38 51.4	13.275	23	4 51 18.66	2.5336	23 8 42.1	7.394
24	2 57 8.22	2.3147	N.14 52 5.4	13.190	24	4 53 50.78	2.5370	N.23 16 1.1	7.238

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	SATURDAY 25.					MONDAY 27.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	4 53 50.78	2.5370	N.23 16 1.1	7.238	0	6 57 15.77	2.5522	N.25 51 21.2	0.848
1	4 56 23.10	2.5403	23 23 10.7	7.081	1	6 59 48.81	2.5491	25 50 25.3	1.015
2	4 58 55.62	2.5436	23 30 10.8	6.922	2	7 2 21.66	2.5458	25 49 19.4	1.181
3	5 1 28.33	2.5467	23 37 1.4	6.763	3	7 4 54.31	2.5424	25 48 3.6	1.346
4	5 4 1.23	2.5497	23 43 42.4	6.603	4	7 7 26.75	2.5388	25 46 37.9	1.510
5	5 6 34.30	2.5526	23 50 13.8	6.443	5	7 9 58.97	2.5351	25 45 2.4	1.673
6	5 9 7.54	2.5554	23 56 35.6	6.282	6	7 12 30.96	2.5313	25 43 17.1	1.837
7	5 11 40.95	2.5582	24 2 47.6	6.118	7	7 15 2.72	2.5274	25 41 22.0	1.999
8	5 14 14.52	2.5607	24 8 49.8	5.955	8	7 17 34.25	2.5234	25 39 17.2	2.159
9	5 16 48.24	2.5632	24 14 42.2	5.791	9	7 20 5.53	2.5192	25 37 2.9	2.319
10	5 19 22.10	2.5655	24 20 24.8	5.627	10	7 22 36.55	2.5149	25 34 38.9	2.479
11	5 21 56.10	2.5677	24 25 57.4	5.461	11	7 25 7.32	2.5106	25 32 5.4	2.637
12	5 24 30.23	2.5698	24 31 20.0	5.293	12	7 27 37.82	2.5060	25 29 22.4	2.795
13	5 27 4.48	2.5718	24 36 32.6	5.127	13	7 30 8.04	2.5013	25 26 30.0	2.951
14	5 29 38.85	2.5737	24 41 35.2	4.959	14	7 32 37.98	2.4966	25 23 28.3	3.107
15	5 32 13.33	2.5754	24 46 27.7	4.791	15	7 35 7.63	2.4917	25 20 17.2	3.262
16	5 34 47.90	2.5769	24 51 10.1	4.622	16	7 37 36.99	2.4867	25 16 56.9	3.415
17	5 37 22.56	2.5784	24 55 42.4	4.453	17	7 40 6.04	2.4817	25 13 27.4	3.567
18	5 39 57.31	2.5797	25 0 4.5	4.283	18	7 42 34.79	2.4766	25 9 48.8	3.718
19	5 42 32.13	2.5809	25 4 16.4	4.113	19	7 45 3.23	2.4713	25 6 1.2	3.867
20	5 45 7.02	2.5819	25 8 18.1	3.943	20	7 47 31.35	2.4660	25 2 4.7	4.017
21	5 47 41.96	2.5828	25 12 9.6	3.772	21	7 49 59.15	2.4606	24 57 59.2	4.166
22	5 50 16.96	2.5837	25 15 50.8	3.601	22	7 52 26.62	2.4550	24 53 44.8	4.312
23	5 52 52.00	2.5842	N.25 19 21.7	3.429	23	7 54 53.75	2.4493	N.24 49 21.7	4.457
	SUNDAY 26.					TUESDAY 28.			
0	5 55 27.07	2.5847	N.25 22 42.3	3.257	0	7 57 20.54	2.4437	N.24 44 49.9	4.602
1	5 58 2.16	2.5850	25 25 52.6	3.085	1	7 59 46.99	2.4379	24 40 9.5	4.745
2	6 0 37.27	2.5852	25 28 52.5	2.912	2	8 2 13.09	2.4320	24 35 20.5	4.887
3	6 3 12.39	2.5853	25 31 42.1	2.741	3	8 4 38.83	2.4260	24 30 23.1	5.027
4	6 5 47.51	2.5852	25 34 21.4	2.568	4	8 7 4.21	2.4200	24 25 17.3	5.167
5	6 8 22.61	2.5848	25 36 50.3	2.395	5	8 9 29.23	2.4140	24 20 3.1	5.305
6	6 10 57.69	2.5845	25 39 8.8	2.222	6	8 11 53.89	2.4079	24 14 40.7	5.441
7	6 13 32.75	2.5840	25 41 17.0	2.050	7	8 14 18.18	2.4017	24 9 10.2	5.576
8	6 16 7.77	2.5832	25 43 14.8	1.877	8	8 16 42.09	2.3954	24 3 31.6	5.711
9	6 18 42.74	2.5824	25 45 2.3	1.705	9	8 19 5.63	2.3891	23 57 44.9	5.844
10	6 21 17.66	2.5814	25 46 39.4	1.532	10	8 21 28.78	2.3827	23 51 50.3	5.975
11	6 23 52.51	2.5802	25 48 6.2	1.361	11	8 23 51.55	2.3762	23 45 47.9	6.105
12	6 26 27.29	2.5790	25 49 22.7	1.189	12	8 26 13.93	2.3697	23 39 37.7	6.234
13	6 29 1.99	2.5775	25 50 28.9	1.017	13	8 28 35.92	2.3632	23 33 19.8	6.362
14	6 31 36.59	2.5758	25 51 24.7	0.845	14	8 30 57.52	2.3567	23 26 54.3	6.487
15	6 34 11.09	2.5742	25 52 10.2	0.673	15	8 33 18.72	2.3500	23 20 21.3	6.612
16	6 36 45.49	2.5723	25 52 45.5	0.503	16	8 35 39.52	2.3434	23 13 40.8	6.736
17	6 39 19.77	2.5703	25 53 10.6	0.332	17	8 37 59.93	2.3367	23 6 53.0	6.857
18	6 41 53.93	2.5682	25 53 25.4	+0.162	18	8 40 19.93	2.3300	22 59 58.0	6.977
19	6 44 27.95	2.5658	25 53 30.0	−0.007	19	8 42 39.53	2.3232	22 52 55.7	7.097
20	6 47 1.83	2.5634	25 53 24.5	0.177	20	8 44 58.72	2.3164	22 45 46.3	7.215
21	6 49 35.56	2.5608	25 53 8.8	0.346	21	8 47 17.50	2.3096	22 38 29.9	7.332
22	6 52 9.13	2.5582	25 52 43.0	0.514	22	8 49 35.87	2.3028	22 31 6.5	7.447
23	6 54 42.54	2.5553	25 52 7.1	0.682	23	8 51 53.84	2.2960	22 23 36.3	7.560
24	6 57 15.77	2.5522	N.25 51 21.2	0.848	24	8 54 11.39	2.2891	N.22 15 59.3	7.672

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

WEDNESDAY 29.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	8 54 11.39	2.2891	N.22 15 59.3	7.672
1	8 56 28.53	2.2822	22 8 15.6	7.782
2	8 58 45.26	2.2753	22 0 25.4	7.892
3	9 1 1.57	2.2684	21 52 28.6	8.000
4	9 3 17.47	2.2616	21 44 25.4	8.107
5	9 5 32.96	2.2547	21 36 15.8	8.212
6	9 7 48.03	2.2477	21 27 59.9	8.316
7	9 10 2.69	2.2408	21 19 37.9	8.417
8	9 12 16.93	2.2339	21 11 9.8	8.519
9	9 14 30.76	2.2271	21 2 35.6	8.619
10	9 16 44.18	2.2202	20 53 55.5	8.717
11	9 18 57.18	2.2132	20 45 9.5	8.814
12	9 21 9.77	2.2064	20 36 17.8	8.909
13	9 23 21.95	2.1995	20 27 20.4	9.003
14	9 25 33.71	2.1927	20 18 17.4	9.097
15	9 27 45.07	2.1859	20 9 8.8	9.188
16	9 29 56.02	2.1791	19 59 54.8	9.278
17	9 32 6.56	2.1722	19 50 35.4	9.367
18	9 34 16.69	2.1655	19 41 10.8	9.453
19	9 36 26.42	2.1588	19 31 41.0	9.540
20	9 38 35.75	2.1521	19 22 6.0	9.625
21	9 40 44.67	2.1454	19 12 26.0	9.708
22	9 42 53.20	2.1387	19 2 41.0	9.790
23	9 45 1.32	2.1321	N.18 52 51.2	9.871

THURSDAY 30.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	9 47 9.05	2.1255	N.18 42 56.5	9.951
1	9 49 16.38	2.1190	18 32 57.1	10.028
2	9 51 23.33	2.1125	18 22 53.1	10.105
3	9 53 29.88	2.1059	18 12 44.5	10.181
4	9 55 36.04	2.0995	18 2 31.4	10.256
5	9 57 41.82	2.0932	17 52 13.8	10.329
6	9 59 47.22	2.0868	17 41 51.9	10.400
7	10 1 52.24	2.0806	17 31 25.8	10.471
8	10 3 56.89	2.0743	17 20 55.4	10.541
9	10 6 1.16	2.0680	17 10 20.9	10.608
10	10 8 5.05	2.0618	16 59 42.4	10.676
11	10 10 8.58	2.0557	16 48 59.8	10.742
12	10 12 11.74	2.0497	16 38 13.4	10.806
13	10 14 14.54	2.0437	16 27 23.1	10.869
14	10 16 16.98	2.0377	16 16 29.1	10.932
15	10 18 19.06	2.0318	16 5 31.3	10.993
16	10 20 20.79	2.0258	15 54 29.9	11.053
17	10 22 22.16	2.0200	15 43 24.9	11.112
18	10 24 23.19	2.0143	15 32 16.5	11.169
19	10 26 23.88	2.0087	15 21 4.6	11.226
20	10 28 24.23	2.0030	15 9 49.4	11.282
21	10 30 24.24	1.9973	14 58 30.8	11.337
22	10 32 23.91	1.9918	14 47 9.0	11.389
23	10 34 23.26	1.9864	14 35 44.1	11.441
24	10 36 22.28	1.9810	N.14 24 16.1	11.493

FRIDAY 31.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	10 36 22.28	1.9810	N.14 24 16.1	11.493
1	10 38 20.98	1.9757	14 12 45.0	11.543
2	10 40 19.36	1.9704	14 1 11.0	11.592
3	10 42 17.43	1.9652	13 49 34.0	11.640
4	10 44 15.18	1.9600	13 37 54.2	11.687
5	10 46 12.63	1.9550	13 26 11.6	11.733
6	10 48 9.78	1.9499	13 14 26.3	11.778
7	10 50 6.62	1.9449	13 2 38.3	11.822
8	10 52 3.17	1.9401	12 50 47.7	11.864
9	10 53 59.43	1.9353	12 38 54.6	11.906
10	10 55 55.40	1.9304	12 26 59.0	11.948
11	10 57 51.08	1.9258	12 15 0.9	11.988
12	10 59 46.49	1.9213	12 3 0.4	12.027
13	11 1 41.63	1.9167	11 50 57.6	12.065
14	11 3 36.49	1.9121	11 38 52.6	12.103
15	11 5 31.08	1.9077	11 26 45.3	12.139
16	11 7 25.41	1.9034	11 14 35.9	12.174
17	11 9 19.49	1.8992	11 2 24.4	12.209
18	11 11 13.31	1.8948	10 50 10.8	12.243
19	11 13 6.87	1.8907	10 37 55.3	12.275
20	11 15 0.19	1.8867	10 25 37.8	12.307
21	11 16 53.27	1.8827	10 13 18.4	12.338
22	11 18 46.11	1.8788	10 0 57.2	12.368
23	11 20 38.72	1.8749	N. 9 48 34.2	12.398

SATURDAY, JANUARY 1, 1910.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	11 22 31.10	1.8712	N. 9 36 9.4	12.427

PHASES OF THE MOON.

			d	h	m
☾	Last Quarter . . .	Dec.	4	4	12.5
●	New Moon		12	7	58.7
☽	First Quarter		19	14	17.7
○	Full Moon		26	9	29.9

			d	h
☾	Apogee	Dec.	6	21.7
☾	Perigee		22	20.8

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	III^{h}	P. L. of Diff.	VI^{h}	P. L. of Diff.	IX^{h}	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
1	**Saturn**	W.	105 30 10	2632	107 8 21	2650	108 46 8	2667	110 23 32	2684
	a Arietis	W.	84 57 50	2749	86 33 25	2766	88 8 37	2783	89 43 27	2800
	Aldebaran	W.	54 19 36	2672	55 56 54	2688	57 33 50	2705	59 10 23	2721
	Jupiter	E.	67 27 47	2703	65 51 9	2719	64 14 55	2737	62 39 5	2755
	Spica	E.	80 43 40	2665	79 6 13	2682	77 29 9	2699	75 52 28	2717
	Sun	E.	126 30 57	2990	125 0 32	3010	123 30 32	3029	122 0 55	3047
2	*a* Arietis	W.	97 32 2	2886	99 4 39	2902	100 36 55	2919	102 8 50	2936
	Aldebaran	W.	67 7 51	2800	68 42 19	2815	70 16 27	2830	71 50 15	2845
	Pollux	W.	22 55 45	2812	24 29 57	2824	26 3 54	2836	27 37 35	2848
	Jupiter	E.	54 45 35	2840	53 11 59	2856	51 38 44	2872	50 5 49	2887
	Spica	E.	67 54 51	2802	66 20 26	2819	64 46 23	2835	63 12 40	2851
	Sun	E.	114 38 28	3137	113 11 3	3154	111 43 59	3171	110 17 15	3188
3	Aldebaran	W.	79 34 42	2914	81 6 43	2926	82 38 29	2938	84 9 59	2950
	Pollux	W.	35 22 3	2909	36 54 10	2921	38 26 2	2932	39 57 40	2943
	Jupiter	E.	42 26 8	2962	40 55 8	2976	39 24 25	2989	37 53 59	3003
	Spica	E.	55 29 6	2926	53 57 20	2940	52 25 52	2954	50 54 41	2968
	Sun	E.	103 8 21	3264	101 43 28	3278	100 18 51	3292	98 54 30	3305
4	Aldebaran	W.	91 43 52	3004	93 13 59	3013	94 43 55	3022	96 13 40	3031
	Pollux	W.	47 32 24	2994	49 2 44	3003	50 32 53	3011	52 2 51	3019
	Jupiter	E.	30 25 53	3066	28 57 2	3078	27 28 26	3090	26 0 4	3103
	Spica	E.	43 23 0	3032	41 53 27	3044	40 24 9	3056	38 55 6	3069
	Sun	E.	91 56 22	3363	90 33 24	3373	89 10 38	3383	87 48 3	3393
5	Aldebaran	W.	103 39 57	3067	105 8 47	3073	106 37 30	3078	108 6 6	3083
	Pollux	W.	59 30 26	3053	60 59 33	3058	62 28 34	3063	63 57 29	3068
	Regulus	W.	23 39 58	3134	25 7 26	3131	26 34 58	3129	28 2 33	3127
	Sun	E.	80 57 30	3431	79 35 49	3437	78 14 14	3443	76 52 46	3448
6	Pollux	W.	71 20 53	3082	72 49 24	3084	74 17 53	3085	75 46 21	3086
	Regulus	W.	35 20 59	3119	36 48 45	3118	38 16 32	3117	39 44 21	3116
	Sun	E.	70 6 37	3464	68 45 33	3466	67 24 32	3468	66 3 32	3469
7	Pollux	W.	83 8 37	3083	84 37 7	3081	86 5 40	3079	87 34 15	3077
	Regulus	W.	47 3 57	3104	48 32 1	3101	50 0 9	3098	51 28 21	3095
	Sun	E.	59 18 39	3467	57 57 38	3465	56 36 34	3463	55 15 28	3460
8	Pollux	W.	94 58 7	3058	96 27 8	3053	97 56 15	3048	99 25 28	3043
	Regulus	W.	58 50 31	3073	60 19 14	3067	61 48 4	3061	63 17 1	3055
	Jupiter	W.	16 56 54	3180	18 23 27	3165	19 50 19	3151	21 17 27	3138
	Sun	E.	48 29 2	3440	47 7 31	3435	45 45 54	3429	44 24 11	3423
9	Pollux	W.	106 53 18	3012	108 23 16	3005	109 53 22	2998	111 23 37	2991
	Regulus	W.	70 43 39	3023	72 13 23	3015	73 43 17	3008	75 13 20	3000
	Jupiter	W.	28 36 37	3085	30 5 4	3075	31 33 44	3065	33 2 36	3056
	Sun	E.	37 33 49	3391	36 11 22	3383	34 48 46	3375	33 26 1	3367
10	Regulus	W.	82 46 5	2959	84 17 9	2950	85 48 24	2942	87 19 50	2933
	Jupiter	W.	40 29 47	3009	41 59 49	2999	43 30 3	2989	45 0 29	2980
	Sun	E.	26 29 57	3325	25 6 15	3316	23 42 22	3307	22 18 19	3298

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XV$^{\text{h}}$	P. L. of Diff.	XVIII$^{\text{h}}$	P. L. of Diff.	XXI$^{\text{h}}$	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
1	SATURN	W.	112 0 33	2701	113 37 11	2718	115 13 27	2735	116 49 20	2752
	α Arietis	W.	91 17 55	2818	92 52 0	2835	94 25 43	2852	95 59 3	2869
	Aldebaran	W.	60 46 35	2737	62 22 25	2753	63 57 54	2769	65 33 3	2785
	JUPITER	E.	61 3 38	2772	59 28 34	2789	57 53 52	2806	56 19 33	2823
	Spica	E.	74 16 11	2735	72 40 17	2752	71 4 46	2769	69 29 37	2786
	SUN	E.	120 31 41	3066	119 2 50	3084	117 34 21	3102	116 6 14	3119
2	α Arietis	W.	103 40 25	2951	105 11 39	2968	106 42 32	2984	108 13 5	2998
	Aldebaran	W.	73 23 45	2859	74 56 56	2873	76 29 49	2887	78 2 24	2901
	Pollux	W.	29 11 0	2861	30 44 9	2873	32 17 2	2885	33 49 40	2897
	JUPITER	E.	48 33 14	2903	47 0 59	2918	45 29 3	2933	43 57 26	2948
	Spica	E.	61 39 18	2866	60 6 16	2882	58 33 34	2897	57 1 11	2911
	SUN	E.	108 50 51	3204	107 24 46	3220	105 59 0	3235	104 33 32	3250
3	Aldebaran	W.	85 41 14	2962	87 12 14	2973	88 43 0	2984	90 13 32	2994
	Pollux	W.	41 29 3	2954	43 0 13	2965	44 31 9	2975	46 1 52	2985
	JUPITER	E.	36 23 50	3016	34 53 57	3029	33 24 20	3042	31 54 59	3054
	Spica	E.	49 23 48	2981	47 53 12	2994	46 22 52	3007	44 52 48	3020
	SUN	E.	97 30 24	3318	96 6 33	3330	94 42 56	3341	93 19 33	3352
4	Aldebaran	W.	97 43 14	3039	99 12 38	3047	100 41 53	3054	102 10 59	3060
	Pollux	W.	53 32 40	3027	55 2 19	3034	56 31 49	3041	58 1 11	3047
	JUPITER	E.	24 31 58	3116	23 4 8	3129	21 36 33	3142	20 9 14	3155
	Spica	E.	37 26 19	3081	35 57 46	3093	34 29 28	3105	33 1 25	3118
	SUN	E.	86 25 37	3401	85 3 22	3409	83 41 16	3417	82 19 19	3424
5	Aldebaran	W.	109 34 36	3087	111 3 0	3091	112 31 20	3095	113 59 35	3099
	Pollux	W.	65 26 18	3071	66 55 3	3075	68 23 43	3078	69 52 20	3081
	Regulus	W.	29 30 10	3125	30 57 50	3124	32 25 31	3122	33 53 14	3120
	SUN	E.	75 31 23	3452	74 10 6	3456	72 48 53	3459	71 27 43	3462
6	Pollux	W.	77 14 48	3087	78 43 14	3086	80 11 41	3085	81 40 8	3084
	Regulus	W.	41 12 11	3114	42 40 3	3112	44 7 58	3110	45 35 56	3107
	SUN	E.	64 42 34	3470	63 21 36	3470	62 0 38	3469	60 39 39	3468
7	Pollux	W.	89 2 53	3073	90 31 35	3070	92 0 21	3066	93 29 11	3062
	Regulus	W.	52 56 36	3091	54 24 56	3087	55 53 22	3082	57 21 54	3078
	SUN	E.	53 54 19	3457	52 33 7	3453	51 11 50	3449	49 50 29	3444
8	Pollux	W.	100 54 48	3037	102 24 14	3031	103 53 48	3025	105 23 29	3019
	Regulus	W.	64 46 5	3049	66 15 17	3043	67 44 36	3037	69 14 3	3030
	JUPITER	W.	22 44 50	3126	24 12 28	3116	25 40 18	3105	27 8 21	3095
	SUN	E.	43 2 21	3417	41 40 24	3411	40 18 20	3404	38 56 8	3398
9	Pollux	W.	112 54 1	2983	114 24 35	2976	115 55 18	2968	117 26 11	2960
	Regulus	W.	76 43 33	2992	78 13 55	2984	79 44 28	2976	81 15 11	2967
	JUPITER	W.	34 31 39	3047	36 0 53	3038	37 30 19	3028	38 59 57	3018
	SUN	E.	32 3 7	3359	30 40 4	3351	29 16 52	3342	27 53 30	3333
10	Regulus	W.	88 51 27	2924	90 23 15	2915	91 55 15	2906	93 27 26	2897
	JUPITER	W.	46 31 7	2970	48 1 57	2960	49 32 59	2950	51 4 14	2940
	SUN	E.	20 54 6	3290	19 29 43	3281	18 5 10	3272	16 40 26	3264

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh	P. L. of Diff.	VIh	P. L. of Diff.	IXh	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
14	SUN	W.	19 52 29	3009	21 22 30	2999	22 52 44	2989	24 23 10	2980
	MARS	E.	87 40 59	2821	86 6 58	2812	84 32 45	2803	82 58 21	2795
	SATURN	E.	94 42 31	2649	93 4 43	2640	91 26 43	2632	89 48 31	2624
	α Arietis	E.	114 59 11	2779	113 24 16	2768	111 49 6	2756	110 13 41	2745
15	SUN	W.	31 58 19	2933	33 29 55	2924	35 1 43	2916	36 33 42	2907
	MARS	E.	75 3 38	2754	73 28 10	2746	71 52 31	2738	70 16 42	2730
	SATURN	E.	81 34 44	2583	79 55 25	2575	78 15 56	2567	76 36 16	2559
	α Arietis	E.	102 13 4	2695	100 36 18	2686	98 59 19	2677	97 22 8	2668
16	SUN	W.	44 16 19	2866	45 49 22	2857	47 22 36	2849	48 56 0	2841
	MARS	E.	62 15 7	2694	60 38 19	2687	59 1 22	2681	57 24 16	2674
	SATURN	E.	68 15 17	2522	66 34 34	2515	64 53 41	2507	63 12 38	2500
	α Arietis	E.	89 13 24	2629	87 35 8	2622	85 56 42	2615	84 18 7	2608
	Aldebaran	E.	119 45 51	2548	118 5 45	2540	116 25 28	2533	114 45 0	2525
17	SUN	W.	56 45 36	2802	58 20 1	2794	59 54 37	2786	61 29 23	2779
	MARS	E.	49 16 32	2642	47 38 34	2636	46 0 28	2630	44 22 14	2624
	SATURN	E.	54 44 51	2465	53 2 48	2458	51 20 35	2451	49 38 12	2444
	α Arietis	E.	76 2 58	2577	74 23 32	2572	72 43 59	2567	71 4 19	2563
	Aldebaran	E.	106 19 54	2486	104 38 21	2478	102 56 37	2471	101 14 43	2463
18	SUN	W.	69 25 39	2741	71 1 24	2734	72 37 19	2726	74 13 24	2719
	MARS	E.	36 9 17	2601	34 30 24	2598	32 51 26	2595	31 12 24	2593
	SATURN	E.	41 3 55	2410	39 20 35	2404	37 37 6	2397	35 53 27	2391
	α Arietis	E.	62 44 34	2545	61 4 23	2543	59 24 10	2541	57 43 54	2540
	Aldebaran	E.	92 42 38	2428	90 59 43	2421	89 16 39	2414	87 33 24	2408
19	SUN	W.	82 16 12	2683	83 53 15	2676	85 30 26	2669	87 7 47	2662
	SATURN	E.	27 12 59	2361	25 28 28	2355	23 43 49	2350	21 59 2	2346
	α Arietis	E.	49 22 32	2547	47 42 24	2551	46 2 22	2557	44 22 28	2564
	Aldebaran	E.	78 54 49	2375	77 10 38	2368	75 26 18	2362	73 41 49	2356
20	SUN	W.	95 16 52	2629	96 55 8	2623	98 33 32	2616	100 12 5	2610
	Aldebaran	E.	64 57 17	2328	63 11 58	2323	61 26 32	2318	59 40 58	2313
	Pollux	E.	109 4 0	2309	107 18 13	2303	105 32 18	2297	103 46 14	2291
21	SUN	W.	108 26 50	2582	110 6 10	2577	111 45 36	2572	113 25 9	2568
	Aldebaran	E.	50 51 34	2294	49 5 25	2291	47 19 11	2289	45 32 54	2287
	Pollux	E.	94 53 50	2264	93 6 58	2260	91 19 59	2255	89 32 53	2250
22	SUN	W.	121 44 23	2549	123 24 29	2546	125 4 38	2543	126 44 51	2541
	MARS	W.	19 3 48	2495	20 45 8	2477	22 26 54	2461	24 9 3	2447
	SATURN	W.	15 25 38	2246	17 12 57	2240	19 0 25	2235	20 48 0	2231
	Aldebaran	E.	36 41 5	2287	34 54 45	2290	33 8 30	2294	31 22 21	2299
	Pollux	E.	80 35 52	2232	78 48 12	2229	77 0 28	2227	75 12 40	2225
	Regulus	E.	116 44 37	2244	114 57 15	2241	113 9 48	2238	111 22 17	2235
23	MARS	W.	32 43 36	2408	34 26 59	2404	36 10 28	2402	37 54 1	2400
	SATURN	W.	29 47 11	2219	31 35 10	2218	33 23 10	2218	35 11 10	2218
	Pollux	E.	66 13 1	2218	64 25 1	2218	62 37 1	2219	60 49 2	2220
	Regulus	E.	102 23 50	2227	100 36 2	2227	98 48 14	2227	97 0 26	2227

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XV^h	P. L. of Diff.	XVIII^h	P. L. of Diff.	XXI^h	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
14	Sun	W.	25 53 48	2970	27 24 38	2961	28 55 40	2951	30 26 54	2942
	Mars	E.	81 23 46	2787	79 49 0	2778	78 14 4	2769	76 38 56	2762
	Saturn	E.	88 10 8	2615	86 31 34	2607	84 52 48	2599	83 13 51	2591
	α Arietis	E.	108 38 1	2735	107 2 7	2724	105 25 59	2714	103 49 38	2704
15	Sun	W.	38 5 52	2899	39 38 13	2891	41 10 44	2882	42 43 26	2874
	Mars	E.	68 40 42	2723	67 4 33	2716	65 28 14	2708	63 51 45	2701
	Saturn	E.	74 56 25	2552	73 16 24	2544	71 36 12	2537	69 55 50	2529
	α Arietis	E.	95 44 45	2660	94 7 11	2652	92 29 26	2644	90 51 30	2636
16	Sun	W.	50 29 35	2833	52 3 20	2825	53 37 15	2817	55 11 20	2809
	Mars	E.	55 47 1	2667	54 9 37	2660	52 32 4	2654	50 54 22	2648
	Saturn	E.	61 31 24	2493	59 50 1	2486	58 8 28	2479	56 26 45	2472
	α Arietis	E.	82 39 22	2601	81 0 29	2595	79 21 27	2589	77 42 17	2583
	Aldebaran	E.	113 4 21	2517	111 23 30	2509	109 42 29	2501	108 1 17	2493
17	Sun	W.	63 4 18	2772	64 39 23	2764	66 14 38	2756	67 50 3	2748
	Mars	E.	42 43 52	2619	41 5 23	2614	39 26 47	2610	37 48 5	2605
	Saturn	E.	47 55 40	2437	46 12 58	2431	44 30 7	2424	42 47 6	2417
	α Arietis	E.	69 24 33	2559	67 44 41	2555	66 4 43	2551	64 24 41	2548
	Aldebaran	E.	99 32 38	2456	97 50 23	2449	96 7 58	2442	94 25 23	2435
18	Sun	W.	75 49 38	2712	77 26 2	2705	79 2 36	2698	80 39 19	2690
	Mars	E.	29 33 20	2592	27 54 14	2593	26 15 9	2594	24 36 5	2596
	Saturn	E.	34 9 39	2384	32 25 42	2378	30 41 36	2373	28 57 22	2367
	α Arietis	E.	56 3 37	2540	54 23 19	2540	52 43 1	2541	51 2 45	2543
	Aldebaran	E.	85 50 0	2401	84 6 27	2394	82 22 44	2387	80 38 51	2381
19	Sun	W.	88 45 18	2655	90 22 58	2649	92 0 47	2642	93 38 45	2635
	Saturn	E.	20 14 9	2342	18 29 10	2338	16 44 5	2335	14 58 56	2334
	α Arietis	E.	42 42 43	2573	41 3 11	2585	39 23 56	2600	37 45 1	2618
	Aldebaran	E.	71 57 11	2350	70 12 25	2345	68 27 31	2339	66 42 28	2333
20	Sun	W.	101 50 46	2604	103 29 35	2599	105 8 32	2593	106 47 37	2587
	Aldebaran	E.	57 55 17	2309	56 9 30	2304	54 23 37	2300	52 37 38	2297
	Pollux	E.	102 0 2	2285	100 13 41	2280	98 27 12	2274	96 40 35	2269
21	Sun	W.	115 4 48	2563	116 44 34	2559	118 24 25	2555	120 4 22	2552
	Aldebaran	E.	43 46 35	2285	42 0 13	2284	40 13 50	2284	38 27 27	2285
	Pollux	E.	87 45 40	2246	85 58 21	2243	84 10 57	2239	82 23 27	2235
22	Sun	W.	128 25 8	2539	130 5 27	2538	131 45 48	2537	133 26 11	2536
	Mars	W.	25 51 31	2436	27 34 15	2427	29 17 12	2419	31 0 20	2413
	Saturn	W.	22 35 42	2228	24 23 29	2225	26 11 20	2223	27 59 14	2221
	Aldebaran	E.	29 36 19	2306	27 50 28	2316	26 4 53	2329	24 19 36	2344
	Pollux	E.	73 24 49	2223	71 36 55	2221	69 48 59	2220	68 1 1	2219
	Regulus	E.	109 34 41	2233	107 47 2	2231	105 59 20	2229	104 11 36	2228
23	Mars	W.	39 37 36	2398	41 21 13	2398	43 4 52	2397	44 48 31	2398
	Saturn	W.	36 59 10	2219	38 47 9	2220	40 35 6	2222	42 23 1	2224
	Pollux	E.	59 1 4	2221	57 13 8	2223	55 25 14	2225	53 37 24	2228
	Regulus	E.	95 12 38	2228	93 24 52	2229	91 37 8	2231	89 49 26	2233

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh	P. L. of Diff.	VIh	P. L. of Diff.	IXh	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
24	MARS	W.	46 32 8	2400	48 15 43	2402	49 59 16	2405	51 42 45	2408
	SATURN	W.	44 10 54	2226	45 58 43	2229	47 46 26	2233	49 34 4	2237
	Pollux	E.	51 49 37	2231	50 1 55	2235	48 14 18	2239	46 26 48	2243
	Regulus	E.	88 1 48	2236	86 14 14	2239	84 26 44	2242	82 39 19	2246
25	MARS	W.	60 18 44	2431	62 1 34	2438	63 44 14	2445	65 26 44	2453
	SATURN	W.	58 30 37	2263	60 17 31	2270	62 4 15	2277	63 50 49	2285
	α Arietis	W.	39 19 56	2522	41 0 38	2512	42 41 35	2503	44 22 45	2496
	Pollux	E.	37 31 14	2274	35 44 37	2282	33 58 12	2291	32 12 0	2301
	Regulus	E.	73 44 1	2274	71 57 23	2281	70 10 56	2288	68 24 39	2296
	JUPITER	E.	117 47 33	2297	116 1 29	2303	114 15 34	2310	112 29 49	2317
26	MARS	W.	73 56 23	2497	75 37 40	2508	77 18 42	2519	78 59 29	2530
	SATURN	W.	72 40 36	2329	74 25 53	2339	76 10 56	2350	77 55 44	2361
	α Arietis	W.	52 50 4	2487	54 31 33	2492	56 12 57	2497	57 54 15	2502
	Aldebaran	W.	21 43 2	2465	23 25 5	2458	25 7 17	2454	26 49 35	2452
	Regulus	E.	59 36 26	2344	57 51 30	2355	56 6 49	2366	54 22 25	2378
	JUPITER	E.	103 43 58	2361	101 59 27	2371	100 15 10	2381	98 31 8	2392
	Spica	E.	113 39 8	2349	111 54 20	2358	110 9 45	2368	108 25 25	2379
27	MARS	W.	87 19 18	2592	88 58 24	2606	90 37 11	2620	92 15 40	2634
	SATURN	W.	86 35 33	2420	88 18 39	2433	90 1 26	2447	91 43 54	2461
	α Arietis	W.	66 18 35	2540	67 58 52	2550	69 38 56	2561	71 18 46	2572
	Aldebaran	W.	35 20 41	2474	37 2 31	2483	38 44 9	2492	40 25 34	2502
	Regulus	E.	45 44 54	2444	44 2 22	2459	42 20 10	2474	40 38 20	2490
	JUPITER	E.	89 54 59	2451	88 12 37	2464	86 30 34	2477	84 48 49	2491
	Spica	E.	99 47 40	2437	98 4 58	2450	96 22 34	2462	94 40 28	2475
28	MARS	W.	100 23 8	2708	101 59 37	2724	103 35 45	2739	105 11 33	2755
	SATURN	W.	100 11 22	2532	101 51 51	2546	103 32 0	2561	105 11 48	2576
	α Arietis	W.	79 33 53	2634	81 12 2	2647	82 49 53	2661	84 27 25	2676
	Aldebaran	W.	48 48 53	2560	50 28 43	2573	52 8 15	2587	53 47 28	2600
	JUPITER	E.	76 24 53	2562	74 45 5	2577	73 5 38	2592	71 26 31	2607
	Spica	E.	86 14 45	2546	84 34 36	2561	82 54 48	2576	81 15 21	2591
29	α Arietis	W.	92 30 8	2751	94 5 40	2767	95 40 51	2782	97 15 42	2798
	Aldebaran	W.	61 58 51	2672	63 36 9	2686	65 13 8	2700	66 49 48	2715
	JUPITER	E.	63 16 7	2683	61 39 4	2698	60 2 22	2714	58 26 1	2729
	Spica	E.	73 3 16	2669	71 25 54	2685	69 48 54	2700	68 12 14	2716
	Antares	E.	118 56 50	2661	117 19 18	2677	115 42 7	2692	114 5 16	2706
30	α Arietis	W.	105 4 42	2880	106 37 27	2896	108 9 51	2912	109 41 54	2929
	Aldebaran	W.	74 48 16	2787	76 23 0	2801	77 57 26	2815	79 31 34	2830
	JUPITER	E.	50 29 19	2805	48 54 58	2820	47 20 57	2835	45 47 15	2850
	Spica	E.	60 14 9	2795	58 39 34	2810	57 5 19	2825	55 31 24	2840
	Antares	E.	106 5 52	2770	104 30 57	2793	102 56 20	2808	101 22 2	2822
31	Aldebaran	W.	87 17 45	2896	88 50 8	2909	90 22 16	2921	91 54 8	2933
	JUPITER	E.	38 3 27	2921	36 31 35	2935	35 0 0	2949	33 28 43	2962
	Spica	E.	47 46 42	2916	46 14 44	2931	44 43 4	2945	43 11 42	2960
	Antares	E.	93 35 0	2888	92 2 26	2901	90 30 9	2913	88 58 7	2925
	SUN	E.	123 44 6	3254	122 19 1	3268	120 54 12	3281	119 29 39	3294

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XV^{h}	P. L. of Diff.	XVIII^{h}	P. L. of Diff.	XXI^{h}	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
24	Mars	W.	53 26 9	2411	55 9 28	2416	56 52 40	2421	58 35 46	2426
	Saturn	W.	51 21 37	2241	53 9 3	2246	54 56 22	2251	56 43 34	2257
	Pollux	E.	44 39 24	2248	42 52 8	2254	41 5 0	2260	39 18 2	2267
	Regulus	E.	80 52 0	2251	79 4 48	2256	77 17 44	2262	75 30 48	2268
25	Mars	W.	67 9 4	2461	68 51 12	2470	70 33 8	2478	72 14 52	2487
	Saturn	W.	65 37 11	2293	67 23 22	2301	69 9 20	2310	70 55 5	2320
	a Arietis	W.	46 4 5	2491	47 45 31	2488	49 27 1	2487	51 8 33	2487
	Pollux	E.	30 26 3	2312	28 40 21	2324	26 54 56	2336	25 9 48	2348
	Regulus	E.	66 38 34	2305	64 52 42	2314	63 7 3	2323	61 21 37	2333
	Jupiter	E.	110 44 15	2325	108 58 52	2333	107 13 41	2342	105 28 43	2351
26	Mars	W.	80 40 0	2542	82 20 15	2554	84 0 13	2566	85 39 54	2579
	Saturn	W.	79 40 15	2372	81 24 30	2384	83 8 28	2396	84 52 9	2408
	a Arietis	W.	59 35 26	2508	61 16 28	2515	62 57 21	2522	64 38 4	2530
	Aldebaran	W.	28 31 56	2453	30 14 16	2456	31 56 32	2460	33 38 41	2466
	Regulus	E.	52 38 18	2390	50 54 29	2403	49 10 58	2416	47 27 46	2430
	Jupiter	E.	96 47 21	2403	95 3 50	2415	93 20 36	2426	91 37 39	2438
	Spica	E.	106 41 20	2390	104 57 31	2401	103 13 57	2412	101 30 40	2424
27	Mars	W.	93 53 49	2648	95 31 39	2663	97 9 9	2678	98 46 19	2693
	Saturn	W.	93 26 3	2475	95 7 52	2488	96 49 22	2502	98 30 32	2517
	a Arietis	W.	72 58 20	2583	74 37 38	2595	76 16 40	2607	77 55 25	2620
	Aldebaran	W.	42 6 45	2513	43 47 41	2524	45 28 21	2535	47 8 45	2547
	Regulus	E.	38 56 53	2507	37 15 49	2524	35 35 8	2542	33 54 52	2560
	Jupiter	E.	83 7 23	2504	81 26 16	2519	79 45 29	2533	78 5 1	2547
	Spica	E.	92 58 40	2489	91 17 12	2503	89 36 3	2517	87 55 14	2532
28	Mars	W.	106 47 0	2771	108 22 6	2788	109 56 50	2804	111 31 13	2820
	Saturn	W.	106 51 16	2591	108 30 23	2607	110 9 9	2622	111 47 34	2638
	a Arietis	W.	86 4 37	2690	87 41 30	2705	89 18 3	2720	90 54 16	2736
	Aldebaran	W.	55 26 23	2614	57 4 59	2628	58 43 16	2643	60 21 13	2657
	Jupiter	E.	69 47 45	2622	68 9 19	2638	66 31 15	2652	64 53 31	2667
	Spica	E.	79 36 14	2607	77 57 28	2622	76 19 3	2638	74 40 59	2653
29	*a* Arietis	W.	98 50 12	2815	100 24 21	2831	101 58 9	2847	103 31 36	2863
	Aldebaran	W.	68 26 8	2729	70 2 9	2744	71 37 50	2758	73 13 12	2772
	Jupiter	E.	56 50 0	2745	55 14 20	2760	53 39 0	2775	52 4 0	2790
	Spica	E.	66 35 55	2732	64 59 57	2747	63 24 20	2763	61 49 4	2779
	Antares	E.	112 28 44	2721	110 52 32	2736	109 16 40	2750	107 41 7	2764
30	*a* Arietis	W.	111 13 36	2946	112 44 57	2962	114 15 57	2979	115 46 36	2995
	Aldebaran	W.	81 5 23	2844	82 38 54	2857	84 12 8	2870	85 45 5	2883
	Jupiter	E.	44 13 53	2865	42 40 49	2880	41 8 4	2894	39 35 37	2907
	Spica	E.	53 57 48	2855	52 24 32	2871	50 51 36	2886	49 18 59	2901
	Antares	E.	99 48 3	2835	98 14 21	2849	96 40 57	2862	95 7 50	2875
31	Aldebaran	W.	93 25 45	2945	94 57 7	2956	96 28 14	2967	97 59 8	2978
	Jupiter	E.	31 57 42	2975	30 26 57	2988	28 56 30	3001	27 26 19	3014
	Spica	E.	41 40 39	2974	40 9 54	2989	38 39 27	3004	37 9 19	3018
	Antares	E.	87 26 20	2937	85 54 48	2948	84 23 31	2959	82 52 27	2970
	Sun	E.	118 5 21	3306	116 41 17	3319	115 17 28	3331	113 53 52	3343

GREENWICH MEAN TIME.

JANUARY.						FEBRUARY.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	*Noon.*	*Noon.*	*Noon.*			*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
1	19 7 43.23	+17.838	−24 35 29.0	+23.26	0 25.8	1	22 0 19.86	+ 1.009	−10 33 21.3	+51.46	1 15.9
2	19 14 51.36	17.838	24 25 24.4	27.13	0 29.0	2	22 0 23.35	− 0.723	10 14 40.2	41.82	1 12.0
3	19 21 59.39	17.830	24 13 46.6	31.03	0 32.2	3	21 59 45.08	2.465	9 59 59.9	31.42	1 7.4
4	19 29 7.10	17.810	24 0 34.8	34.95	0 35.4	4	21 58 25.30	4.176	9 49 36.5	20.46	1 2.2
5	19 36 14.21	17.780	23 45 48.7	38.89	0 38.6	5	21 56 25.27	5.810	9 43 40.1	+ 9.21	0 56.2
6	19 43 20.48	+17.739	−23 29 28.0	+42.84	0 41.7	6	21 53 47.46	− 7.316	− 9 42 14.6	− 2.05	0 49.6
7	19 50 25.58	17.684	23 11 32.6	46.78	0 44.9	7	21 50 35.51	8.645	9 45 15.9	12.97	0 42.5
8	19 57 29.16	17.613	22 52 2.7	50.71	0 48.0	8	21 46 54.27	9.750	9 52 32.0	23.23	0 34.9
9	20 4 30.87	17.526	22 30 58.7	54.61	0 51.1	9	21 42 49.58	10.593	10 3 43.3	32.52	0 26.9
10	20 11 30.25	17.420	22 8 21.3	58.48	0 54.2	10	21 38 28.09	11.146	10 18 23.2	40.58	0 18.6
11	20 18 26.84	+17.292	−21 44 11.7	+62.30	0 57.2	11	21 33 56.95	−11.397	−10 35 59.6	−47.21	0 10.2
12	20 25 20.08	17.141	21 18 31.4	66.05	1 0.1	12	21 29 23.43	11.347	10 55 56.9	52.31	0 1.8 23 53.4
13	20 32 9.38	16.962	20 51 22.4	69.68	1 3.0	13	21 24 54.56	11.014	11 17 38.0	55.87	23 45.2
14	20 38 54.03	16.753	20 22 47.5	73.19	1 5.8	14	21 20 36.81	10.426	11 40 25.8	57.91	23 37.3
15	20 45 33.26	16.509	19 52 49.9	76.56	1 8.5	15	21 16 35.86	9.621	12 3 45.8	58.56	23 29.7
16	20 52 6.16	+16.225	−19 21 34.1	+79.72	1 11.1	16	21 12 56.43	− 8.640	−12 27 6.8	−58.00	23 22.6
17	20 58 31.70	15.896	18 49 5.3	82.64	1 13.6	17	21 9 42.16	7.531	12 50 1.7	56.42	23 15.9
18	21 4 48.75	15.516	18 15 29.8	85.27	1 15.9	18	21 6 55.64	6.334	13 12 8.3	54.00	23 9.7
19	21 10 55.99	15.077	17 40 55.2	87.54	1 18.1	19	21 4 38.52	5.087	13 33 8.5	50.92	23 4.0
20	21 16 51.92	14.573	17 5 30.8	89.41	1 20.1	20	21 2 51.61	3.822	13 52 48.4	47.34	22 58.7
21	21 22 34.91	+13.997	−16 29 27.4	+90.79	1 21.8	21	21 1 35.00	− 2.566	−14 10 57.6	−43.39	22 54.0
22	21 28 3.07	13.338	15 52 57.4	91.60	1 23.3	22	21 0 48.22	1.339	14 27 28.9	39.19	22 49.8
23	21 33 14.34	12.587	15 16 15.6	91.76	1 24.6	23	21 0 30.38	− 0.157	14 42 17.3	34.82	22 46.0
24	21 38 6.47	11.738	14 39 38.4	91.19	1 25.5	24	21 0 40.26	+ 0.971	14 55 19.9	30.37	22 42.6
25	21 42 37.00	10.784	14 3 24.6	89.80	1 26.0	25	21 1 16.50	2.038	15 6 35.0	25.88	22 39.7
26	21 46 43.31	+ 9.720	−13 27 55.1	+87.49	1 26.2	26	21 2 17.57	+ 3.040	−15 16 2.2	−21.38	22 37.1
27	21 50 22.66	8.539	12 53 32.9	84.19	1 25.9	27	21 3 41.91	3.977	15 23 41.6	16.91	22 34.9
28	21 53 32.24	7.240	12 20 42.4	79.84	1 25.0	28	21 5 27.95	4.849	15 29 34.1	12.48	22 33.1
29	21 56 9.27	5.827	11 49 49.4	74.39	1 23.6	29	21 7 34.13	5.657	15 33 41.0	8.10	22 31.5
30	21 58 11.09	4.308	11 21 20.6	67.82	1 21.7	30	21 9 58.98	6.405	15 36 3.6	− 3.79	22 30.3
31	21 59 35.29	+ 2.695	−10 55 42.7	+60.16	1 19.2	31	21 12 41.11	+ 7.096	−15 36 43.5	+ 0.45	22 29.3
32	22 0 19.86	+ 1.009	−10 33 21.3	+51.46	1 15.9	32	21 15 39.17	+ 7.734	−15 35 42.3	+ 4.64	22 28.5

Day of the Month.	1st.	6th.	11th.	16th.	21st.	26th.	31st.
	″	″	″	″	″	″	″
Semidiameter	2.37	2.44	2.56	2.74	3.01	3.40	3.96
Hor. Parallax	6.25	6.44	6.75	7.22	7.92	8.97	10.43

Day of the Month.	5th.	10th.	15th.	20th.	25th.
	″	″	″	″	″
Semidiameter	4.61	5.09	5.16	4.88	4.46
Horizontal Parallax . .	12.14	13.42	13.61	12.85	11.74

Note.—The sign + indicates north declinations; the sign — indicates south declinations.

GREENWICH MEAN TIME.

MARCH.

Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ′ ″	″	h m
1	21 7 34.13	+ 5.657	−15 33 41.0	− 8.10	22 31.5
2	21 9 58.98	6.405	15 36 3.6	− 3.79	22 30.3
3	21 12 41.11	7.096	15 36 43.5	+ 0.45	22 29.3
4	21 15 39.17	7.734	15 35 42.3	4.64	22 28.5
5	21 18 51.92	8.321	15 33 1.7	8.74	22 28.0
6	21 22 18.20	+ 8.862	−15 28 43.3	+ 12.78	22 27.7
7	21 25 56.95	9.361	15 22 48.7	16.76	22 27.6
8	21 29 47.20	9.820	15 15 19.5	20.66	22 27.7
9	21 33 48.03	10.243	15 6 17.3	24.51	22 27.9
10	21 37 58.62	10.634	14 55 43.6	28.30	22 28.3
11	21 42 18.23	+ 10.995	−14 43 39.7	+ 32.02	22 28.8
12	21 46 46.16	11.328	14 30 7.0	35.70	22 29.4
13	21 51 21.80	11.638	14 15 6.7	39.31	22 30.2
14	21 56 4.59	11.925	13 58 40.2	42.88	22 31.1
15	22 0 54.02	12.192	13 40 48.8	46.39	22 32.0
16	22 5 49.65	+ 12.441	−13 21 33.5	+ 49.86	22 33.1
17	22 10 51.08	12.675	13 0 55.3	53.30	22 34.3
18	22 15 57.92	12.893	12 38 55.5	56.68	22 35.5
19	22 21 9.85	13.099	12 15 35.2	60.01	22 36.9
20	22 26 26.59	13.294	11 50 55.4	63.30	22 38.3
21	22 31 47.91	+ 13.480	−11 24 57.0	+ 66.57	22 39.8
22	22 37 13.58	13.658	10 57 41.0	69.77	22 41.3
23	22 42 43.43	13.828	10 29 8.5	72.94	22 42.9
24	22 48 17.30	13.993	9 59 20.4	76.07	22 44.6
25	22 53 55.08	14.154	9 28 17.5	79.16	22 46.4
26	22 59 36.68	+ 14.312	− 8 56 0.8	+ 82.22	22 48.2
27	23 5 22.04	14.467	8 22 31.2	85.24	22 50.1
28	23 11 11.11	14.622	7 47 49.7	88.22	22 52.0
29	23 17 3.89	14.776	7 11 57.1	91.16	22 54.0
30	23 23 0.38	14.932	6 34 54.3	94.07	22 56.1
31	23 29 0.62	+ 15.089	− 5 56 42.2	+ 96.93	22 58.2
32	23 35 4.66	+ 15.248	− 5 17 21.9	+ 99.75	23 0.4

APRIL.

Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ′ ″	″	h m
1	23 35 4.66	+ 15.248	− 5 17 21.9	+ 99.75	23 0.4
2	23 41 12.57	15.411	4 36 54.4	102.53	23 2.6
3	23 47 24.43	15.578	3 55 20.9	105.26	23 4.9
4	23 53 40.37	15.751	3 12 42.4	107.94	23 7.3
5	0 0 0.51	15.929	2 29 0.2	110.56	23 9.8
6	0 6 25.00	+ 16.113	− 1 44 15.9	+ 113.12	23 12.3
7	0 12 53.98	16.304	0 58 30.9	115.61	23 15.0
8	0 19 27.63	16.502	− 0 11 47.0	118.03	23 17.7
9	0 26 6.14	16.708	+ 0 35 53.7	120.35	23 20.4
10	0 32 49.68	16.922	1 24 29.2	122.58	23 23.3
11	0 39 38.44	+ 17.144	+ 2 13 56.8	+ 124.70	23 26.3
12	0 46 32.63	17.373	3 4 13.6	126.68	23 29.3
13	0 53 32.40	17.610	3 55 16.3	128.52	23 32.5
14	1 0 37.95	17.854	4 47 1.1	130.18	23 35.8
15	1 7 49.42	18.103	5 39 23.6	131.65	23 39.1
16	1 15 6.93	+ 18.357	+ 6 32 18.7	+ 132.90	23 42.6
17	1 22 30.58	18.614	7 25 40.6	133.89	23 46.1
18	1 30 0.38	18.871	8 19 22.9	134.59	23 49.8
19	1 37 36.33	19.125	9 13 18.3	134.97	23 53.6
20	1 45 18.31	19.373	10 7 18.6	134.99	23 57.4
21	1 53 6.15	+ 19.611	+ 11 1 14.7	+ 134.61	. .
22	2 0 59.55	19.836	11 54 56.6	133.80	0 1.4
23	2 8 58.13	20.041	12 48 13.5	132.53	0 5.4
24	2 17 1.36	20.223	13 40 53.9	130.76	0 9.6
25	2 25 8.58	20.375	14 32 45.7	128.47	0 13.7
26	2 33 19.07	+ 20.493	+ 15 23 36.4	+ 125.67	0 18.0
27	2 41 31.91	20.572	16 13 13.4	122.34	0 22.3
28	2 49 46.12	20.606	17 1 24.3	118.49	0 26.6
29	2 58 0.61	20.592	17 47 57.0	114.15	0 30.9
30	3 6 14.21	20.531	18 32 40.2	109.38	0 35.2
31	3 14 25.73	+ 20.419	+ 19 15 23.8	+ 104.20	0 39.5
32	3 22 33.94	+ 20.256	+ 19 55 58.6	+ 98.65	0 43.7

Day of the Month.	2d.	7th.	12th.	17th.	22d.	27th.
	″	″	″	″	″	″
Semidiameter . .	4.05	3.70	3.43	3.20	3.01	2.85
Hor. Parallax . .	10.68	9.77	9.03	8.42	7.92	7.51

Day of the Month.	1st.	6th.	11th.	16th.	21st.	26th.
	″	″	″	″	″	″
Semidiameter . .	2.72	2 62	2.55	2.51	2.51	2.57
Hor. Parallax . .	7.18	6.91	6.71	6.61	6.61	6.78

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing or south declinations are decreasing. The sign — indicates that north declinations are decreasing or south declinations increasing.

GREENWICH MEAN TIME.

MAY.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	3 14 25.74	+ 20.419	+19 15 23.8	+ 104.20	0 39.5
2	3 22 33.94	20.256	19 55 58.6	98.65	0 43.7
3	3 30 37.60	20.041	20 34 17.2	92.84	0 47.8
4	3 38 35.51	19.776	21 10 13.4	86.81	0 51.8
5	3 46 26.52	19.466	21 43 42.7	80.62	0 55.7
6	3 54 9.53	+ 19.111	+22 14 42.3	+ 74.33	0 59.5
7	4 1 43.50	18.714	22 43 10.5	68.01	1 3.1
8	4 9 7.48	18.279	23 9 7.0	61.71	1 6.6
9	4 16 20.58	17.807	23 32 32.9	55.47	1 9.8
10	4 23 21.98	17.304	23 53 30.1	49.32	1 12.9
11	4 30 10.94	+ 16.771	+24 12, 1.5	+ 43.32	1 15.8
12	4 36 46.75	16.209	24 28 10.6	37.47	1 18.5
13	4 43 8.79	15.623	24 42 1.4	31.79	1 20.9
14	4 49 16.47	15.013	24 53 38.4	26.31	1 23.1
15	4 55 9.22	14.379	25 3 6.1	21.03	1 25.0
16	5 0 46.50	+ 13.724	+25 10 29.6	+ 15.96	1 26.6
17	5 6 7.82	13.049	25 15 54.0	11.11	1 28.0
18	5 11 12.69	12.353	25 19 24.4	6.46	1 29.2
19	5 16 0.62	11.638	25 21 5.8	+ 2.02	1 30.0
20	5 20 31.17	10.904	25 21 3.3	− 2.19	1 30.5
21	5 24 43.88	+ 10.152	+25 19 22.1	− 6.21	1 30.8
22	5 28 38.32	9.382	25 16 6.9	10.02	1 30.8
23	5 32 14.06	8.594	25 11 22.6	13.64	1 30.4
24	5 35 30.72	7.791	25 5 13.9	17.05	1 29.7
25	5 38 27.92	6.973	24 57 45.5	20.27	1 28.7
26	5 41 5.31	+ 6.141	+24 49 2.1	− 23.31	1 27.4
27	5 43 22.61	5.299	24 39 8.1	26.17	1 25.7
28	5 45 19.58	4.447	24 28 7.9	28.81	1 23.7
29	5 46 56.03	3.590	24 16 5.9	31.30	1 21.3
30	5 48 11.86	2.730	24 3 6.7	33.61	1 18.6
31	5 49 7.08	+ 1.873	+23 49 14.7	− 35.71	1 15.6
32	5 49 41.83	+ 1.024	+23 34 34.6	− 37.61	1 12.2

JUNE.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	5 49 41.83	+ 1.024	+23 34 34.6	− 37.61	1 12.2
2	5 49 56.36	+ 0.189	23 19 11.2	39.31	1 8.5
3	5 49 51.08	− 0.625	23 3 9.5	40.79	1 4.5
4	5 49 26.57	1.411	22 46 34.9	42.05	1 0.1
5	5 48 43.62	2.161	22 29 32.9	43.07	0 55.5
6	5 47 43.21	− 2.865	+22 12 9.7	− 43.81	0 50.5
7	5 46 26.52	3.516	21 54 32.1	44.27	0 45.3
8	5 44 54.96	4.103	21 36 47.2	44.42	0 39.8
9	5 43 10.16	4.618	21 19 2.5	44.24	0 34.1
10	5 41 13.93	5.054	21 1 26.1	43.73	0 28.3
11	5 39 8.25	− 5.404	+20 44 6.6	− 42.84	0 22.3
12	5 36 55.28	5.661	20 27 13.1	41.56	0 16.1
13	5 34 37.29	5.822	20 10 54.6	39.91	0 9.9
14	5 32 16.61	5.884	19 55 20.3	37.89	0 3.7 23 57.4
15	5 29 55.64	5.847	19 40 39.3	35.47	23 51.2
16	5 27 36.74	− 5.712	+19 27 0.4	− 32.71	23 45.0
17	5 25 22.24	5.481	19 14 31.9	29.61	23 39.0
18	5 23 14.36	5.161	19 3 21.3	26.22	23 33.1
19	5 21 15.22	4.756	18 53 35.2	22.58	23 27.4
20	5 19 26.77	4.272	18 45 19.1	18.73	23 21.8
21	5 17 50.77	− 3.718	+18 38 37.6	− 14.70	23 16.5
22	5 16 28.80	3.103	18 33 34.1	10.57	23 11.5
23	5 15 22.26	2.434	18 30 10.4	6.39	23 6.7
24	5 14 32.33	1.720	18 28 27.3	− 2.21	23 2.2
25	5 14 0.01	0.968	18 28 24.3	+ 1.94	22 58.1
26	5 13 46.13	− 0.185	+18 29 59.9	+ 6.01	22 54.3
27	5 13 51.35	+ 0.623	18 33 11.5	9.94	22 50.7
28	5 14 16.17	1.449	18 37 55.5	13.70	22 47.5
29	5 15 1.01	2.290	18 44 7.4	17.26	22 44.6
30	5 16 6.15	3.139	18 51 42.1	20.59	22 42.1
31	5 17 31.74	+ 3.995	+19 0 33.5	+ 23.66	22 39.9
32	5 19 17.95	+ 4.856	+19 10 35.3	+ 26.44	22 38.0

Day of the Month.	1st.	6th.	11th.	16th.	21st.	26th.	31st.
	″	″	″	″	″	″	″
Semidiameter.	2.71	2.94	3.25	3.64	4.10	4.62	5.18
Hor. Parallax.	7.14	7.74	8.56	9.59	10.81	12.18	13.61

Day of the Month.	5th.	10th.	15th.	20th.	25th.	30th.
	″	″	″	″	″	″
Semidiameter. .	5.64	5.98	6.04	5.79	5.35	4.80
Hor. Parallax. .	14.90	15.74	15.91	15.29	14.08	12.61

NOTE.—The sign + indicates north declinations; the sign − indicates south declinations.

GREENWICH MEAN TIME.

	JULY.						AUGUST.				
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	*Noon.*	*Noon.*	*Noon.*			*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
1	5 17 31.74	+ 3.995	+19 0 33.5	+23.66	22 39.9	1	8 31 45.77	+21.872	+20 29 16.2	− 66.05	23 58.7
2	5 19 17.95	4.856	19 10 35.3	26.44	22 38.0	2	8 40 28.16	21.653	20 1 45.1	71.49	. .
3	5 21 24.85	5.719	19 21 40.3	28.92	22 36.5	3	8 49 4.77	21.391	19 32 7.8	76.56	0 3.4
4	5 23 52.45	6.581	19 33 40.9	31.08	22 35.4	4	8 57 34.68	21.095	19 0 33.4	81.24	0 8.0
5	5 26 40.73	7.442	19 46 29.3	32.90	22 34.6	5	9 5 57.16	20.773	18 27 11.2	85.54	0 12.4
6	5 29 49.67	+ 8.302	+19 59 57.1	+34.36	22 34.1	6	9 14 11.62	+20.429	+17 52 10.6	− 89.44	0 16.7
7	5 33 19.20	9.159	20 13 55.4	35.44	22 34.0	7	9 22 17.65	20.071	17 15 40.9	92.97	0 20.9
8	5 37 9.26	10.011	20 28 15.2	36.14	22 34.2	8	9 30 14.95	19.703	16 37 51.1	96.12	0 24.9
9	5 41 19.76	10.862	20 42 46.8	36.42	22 34.7	9	9 38 3.35	19.330	15 58 49.8	98.93	0 28.8
10	5 45 50.59	11.706	20 57 20.4	36.30	22 35.6	10	9 45 42.78	18.956	15 18 45.1	101.41	0 32.5
11	5 50 41.61	+12.545	+21 11 45.5	+35.72	22 36.8	11	9 53 13.24	+18.583	+14 37 44.9	−103.57	0 36.1
12	5 55 52.67	13.376	21 25 51.5	34.70	22 38.4	12	10 0 34.81	18.215	13 55 56.3	105.43	0 39.5
13	6 1 23.56	14.196	21 39 27.3	33.20	22 40.3	13	10 7 47.61	17.853	13 13 26.2	107.03	0 42.8
14	6 7 14.00	15.005	21 52 21.4	31.23	22 42.5	14	10 14 51.83	17.499	12 30 20.7	108.38	0 45.9
15	6 13 23.66	15.798	22 4 22.2	28.76	22 45.0	15	10 21 47.63	17.153	11 46 45.7	109.49	0 48.9
16	6 19 52.13	+16.572	+22 15 17.8	+25.79	22 47.8	16	10 28 35.27	+16.818	+11 2 46.7	−110.39	0 51.7
17	6 26 38.89	17.320	22 24 56.2	22.32	22 51.0	17	10 35 14.98	16.492	10 18 28.5	111.09	0 54.5
18	6 33 43.27	18.039	22 33 5.2	18.34	22 54.4	18	10 41 46.99	16.177	9 33 55.7	111.61	0 57.1
19	6 41 4.48	18.722	22 39 32.8	13.88	22 58.0	19	10 48 11.57	15.872	8 49 12.7	111.95	0 59.5
20	6 48 41.56	19.360	22 44 7.7	8.95	23 2.0	20	10 54 28.94	15.578	8 4 23.3	112.14	1 1.9
21	6 56 33.37	+19.949	+22 46 39.0	+ 3.59	23 6.1	21	11 0 39.37	+15.293	+ 7 19 31.2	−112.18	1 4.1
22	7 4 38.64	20.480	22 46 56.8	− 2.17	23 10.5	22	11 6 43.07	15.017	6 34 39.9	112.08	1 6.2
23	7 12 55.91	20.948	22 44 52.3	8.27	23 15.0	23	11 12 40.29	14.752	5 49 52.4	111.86	1 8.2
24	7 21 23.59	21.347	22 40 18.2	14.63	23 19.7	24	11 18 31.23	14.494	5 5 11.7	111.51	1 10.1
25	7 29 59.96	21.671	22 33 8.6	21.19	23 24.4	25	11 24 16.09	14.245	4 20 40.8	111.05	1 11.9
26	7 38 43.20	+21.919	+22 23 19.8	−27.88	23 29.3	26	11 29 55.05	+14.003	+ 3 36 22.3	−110.48	1 13.6
27	7 47 31.46	22.090	22 10 50.1	34.59	23 34.2	27	11 35 28.28	13.768	2 52 18.6	109.81	1 15.2
28	7 56 22.91	22.185	21 55 39.6	41.27	23 39.2	28	11 40 55.97	13.539	2 8 32.2	109.04	1 16.7
29	8 5 15.73	22.205	21 37 50.3	47.81	23 44.2	29	11 46 18.20	13.316	1 25 5.5	108.17	1 18.2
30	8 14 8.18	22.155	21 17 26.1	54.16	23 49.1	30	11 51 35.12	13.096	+ 0 42 0.6	107.22	1 19.5
31	8 22 58.68	+22.043	+20 54 32.5	−60.25	23 53.9	31	11 56 46.81	+12.879	− 0 0 40.2	−106.17	1 20.7
32	8 31 45.77	+21.872	+20 29 16.2	−66.05	23 58.7	32	12 1 53.37	+12.666	− 0 42 54.7	−105.03	1 21.9

Day of the Month.	5th.	10th.	15th.	20th.	25th.	30th.	Day of the Month.	4th.	9th.	14th.	19th.	24th.	29th.
	″	″	″	″	″	″		″	″	″	″	″	″
Semidiameter . .	4.23	3.72	3.29	2.95	2.71	2.56	Semidiameter . .	2.47	2.47	2.49	2.55	2.63	2.73
Hor. Parallax .	11.14	9.80	8.67	7.78	7.14	6.74	Hor. Parallax . .	6.54	6.50	6.57	6.71	6.92	7.21

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing or south declinations are decreasing. The sign — indicates that north declinations are decreasing or south declinations increasing.

GREENWICH MEAN TIME.

SEPTEMBER.

Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ′ ″	″	h m
1	12 1 53.37	+12.666	− 0 42 54.7	−105.03	1 21.9
2	12 6 54.83	12.455	1 24 40.8	103.80	1 23.0
3	12 11 51.23	12.245	2 5 56.3	102.48	1 24.0
4	12 16 42.58	12.034	2 46 39.0	101.07	1 24.9
5	12 21 28.84	11.821	3 26 46.8	99.56	1 25.7
6	12 26 9.98	+11.606	− 4 6 17.3	− 97.96	1 26.5
7	12 30 45.90	11.387	4 45 8.1	96.26	1 27.1
8	12 35 16.49	11.162	5 23 16.8	94.45	1 27.7
9	12 39 41.59	10.929	6 0 40.7	92.53	1 28.1
10	12 44 1.01	10.687	6 37 17.2	90.49	1 28.5
11	12 48 14.51	+10.435	− 7 13 3.2	− 88.32	1 28.8
12	12 52 21.81	10.171	7 47 55.6	86.02	1 29.0
13	12 56 22.58	9.891	8 21 51.1	83.57	1 29.0
14	13 0 16.43	9.593	8 54 45.8	80.96	1 29.0
15	13 4 2.90	9.276	9 26 35.8	78.17	1 28.8
16	13 7 41.50	+ 8.936	− 9 57 16.7	− 75.20	1 28.5
17	13 11 11.63	8.570	10 26 43.7	72.01	1 28.0
18	13 14 32.65	8.176	10 54 51.7	68.60	1 27.4
19	13 17 43.82	7.749	11 21 34.8	64.94	1 26.7
20	13 20 44.32	7.286	11 46 46.6	61.00	1 25.7
21	13 23 33.23	+ 6.783	−12 10 20.3	− 56.76	1 24.6
22	13 26 9.54	6.235	12 32 8.1	52.17	1 23.3
23	13 28 32.17	5.641	12 52 1.3	47.20	1 21.7
24	13 30 39.89	4.994	13 9 50.4	41.82	1 19.9
25	13 32 31.42	4.291	13 25 24.9	35.98	1 17.8
26	13 34 5.37	+ 3.527	−13 38 33.5	− 29.65	1 15.4
27	13 35 20.29	2.704	13 49 3.7	22.77	1 12.7
28	13 36 14.68	1.817	13 56 41.9	15.31	1 9.6
29	13 36 47.02	+ 0.868	14 1 13.9	− 7.24	1 6.2
30	13 36 55.84	− 0.142	14 2 24.5	+ 1.47	1 2.4
31	13 36 39.76	− 1.206	−13 59 58.3	+ 10.82	0 58.2
32	13 35 57.59	− 2.315	−13 53 39.9	+ 20.80	0 53.5

Day of the Month.	3d.	8th.	13th.	18th.	23d.	28th.
	″	″	″	″	″	″
Semidiameter .	2.87	3.03	3.24	3.50	3.83	4.23
Hor. Parallax .	7.56	8.00	8.54	9.24	10.09	11.13

OCTOBER.

Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ′ ″	″	h m
1	13 36 39.76	− 1.206	−13 59 58.3	+ 10.82	0 58.2
2	13 35 57.59	2.315	13 53 39.9	20.80	0 53.5
3	13 34 48.42	3.452	13 43 14.6	31.38	0 48.4
4	13 33 11.77	4.601	13 28 29.6	42.44	0 42.9
5	13 31 7.70	5.733	13 9 15.7	53.77	0 36.9
6	13 28 36.97	− 6.817	−12 45 28.0	+ 65.19	0 30.5
7	13 25 41.19	7.813	12 17 8.3	76.37	0 23.6
8	13 22 22.96	8.681	11 44 26.8	86.94	0 16.4
9	13 18 45.90	9.374	11 7 43.9	96.42	0 8.9
10	13 14 54.70	9.851	10 27 31.4	104.32	0 1.1 23 58.1
11	13 10 55.01	−10.077	− 9 44 33.0	+110.17	23 45.1
12	13 6 53.24	10.021	8 59 42.7	113.56	23 37.2
13	13 2 56.31	9.672	8 14 4.2	114.15	23 29.5
14	12 59 11.30	9.032	7 28 46.5	111.82	23 22.1
15	12 55 45.00	8.116	6 44 59.8	106.60	23 15.1
16	12 52 43.65	− 6.959	− 6 3 51.8	+ 98.65	23 8.6
17	12 50 12.50	5.607	5 26 23.5	88.36	23 2.7
18	12 48 15.70	4.106	4 53 25.6	76.19	22 57.5
19	12 46 56.13	2.513	4 25 37.1	62.67	22 52.9
20	12 46 15.41	− 0.878	4 3 23.9	48.33	22 48.9
21	12 46 13.97	+ 0.753	− 3 46 59.9	+ 33.67	22 45.6
22	12 46 51.21	2.340	3 36 27.6	19.09	22 42.9
23	12 48 5.68	3.851	3 31 40.1	+ 4.98	22 40.8
24	12 49 55.30	5.265	3 32 22.7	− 8.39	22 39.3
25	12 52 17.54	6.568	3 38 15.4	20.83	22 38.2
26	12 55 9.59	+ 7.749	− 3 48 54.0	− 32.21	22 37.6
27	12 58 28.53	8.809	4 3 52.5	42.47	22 37.4
28	13 2 11.47	9.750	4 22 43.6	51.59	22 37.6
29	13 6 15.62	10.577	4 45 0.1	59.60	22 38.0
30	13 10 38.33	11.299	5 10 15.8	66.53	22 38.7
31	13 15 17.19	+11.924	− 5 38 5.6	− 72.46	22 39.6
32	13 20 10.02	+12.464	− 6 8 6.3	− 77.45	22 40.7

Day of the Month.	3d.	8th.	13th.	18th.	23d.	28th.
	″	″	″	″	″	″
Semidiameter .	4.66	5.00	4.99	4.53	3.92	3.37
Hor. Parallax .	12.28	13.17	13.15	11.97	10.32	8.89

NOTE.—The sign + indicates north declinations; the sign − indicates south declinations.

GREENWICH MEAN TIME.

NOVEMBER.

Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″	h m
1	13 20 10.02	+ 12.464	− 6 8 6.3	− 77.45	22 40.7
2	13 25 14.87	12.928	6 39 56.4	81.59	22 42.0
3	13 30 30.03	13.325	7 13 16.5	84.96	22 43.5
4	13 35 54.01	13.665	7 47 49.1	87.64	22 45.0
5	13 41 25.54	13.954	8 23 18.4	89.70	22 46.7
6	13 47 3.52	+ 14.204	− 8 59 30.5	− 91.21	22 48.5
7	13 52 47.03	14.417	9 36 12.9	92.24	22 50.4
8	13 58 35.29	14.601	10 13 14.8	92.85	22 52.3
9	14 4 27.67	14.760	10 50 26.6	93.07	22 54.3
10	14 10 23.61	14.899	11 27 39.7	92.97	22 56.3
11	14 16 22.69	+ 15.022	− 12 4 46.7	− 92.57	22 58.4
12	14 22 24.55	15.131	12 41 41.0	91.92	23 0.5
13	14 28 28.91	15.230	13 18 16.9	91.04	23 2.7
14	14 34 35.54	15.320	13 54 29.1	89.95	23 4.9
15	14 40 44.27	15.405	14 30 13.1	88.69	23 7.2
16	14 46 54.94	+ 15.485	− 15 5 24.9	− 87.26	23 9.4
17	14 53 7.48	15.560	15 40 0.8	85.70	23 11.7
18	14 59 21.80	15.633	16 13 57.6	84.01	23 14.1
19	15 5 37.84	15.704	16 47 12.3	82.20	23 16.4
20	15 11 55.58	15.774	17 19 42.3	80.29	23 18.8
21	15 18 15.00	+ 15.844	− 17 51 25.2	− 78.28	23 21.2
22	15 24 36.11	15.915	18 22 18.6	76.17	23 23.7
23	15 30 58.90	15.985	18 52 20.5	73.98	23 26 1
24	15 37 23.40	16.056	19 21 28.9	71.71	23 28.6
25	15 43 49.61	16.128	19 49 42.0	69.37	23 31.1
26	15 50 17.56	+ 16.201	− 20 16 58.0	− 66.94	23 33.7
27	15 56 47.27	16.275	20 43 15.2	64.47	23 36.3
28	16 3 18.77	16.349	21 8 32.0	61.91	23 38.9
29	16 9 52.07	16.425	21 32 46.9	59.31	23 41.5
30	16 16 27.19	16.501	21 55 58.4	56.64	23 44.2
31	16 23 4.13	+ 16.577	− 22 18 4.9	− 53.90	23 46.9
32	16 29 42.90	+ 16.654	− 22 39 4.9	− 51.10	23 49.7

Day of the Month.	2d.	7th.	12th.	17th.	22d.	27th.
	″	″	″	″	″	″
Semidiameter . .	2.99	2.72	2.55	2.44	2.37	2.32
Hor. Parallax . .	7.87	7.18	6.72	6.42	6.23	6.11

DECEMBER.

Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″	h m
1	16 23 4.13	+ 16.577	− 22 18 4.8	− 53.90	23 46.9
2	16 29 42.90	16.654	22 39 4.9	51.10	23 49.7
3	16 36 23.50	16.730	22 58 57.1	48.24	23 52.4
4	16 43 5.92	16.805	23 17 39.9	45.32	23 55.2
5	16 49 50.15	16.880	23 35 11.9	42.34	23 58.1
6	16 56 36.16	+ 16.954	− 23 51 31.7	− 39.31	. .
7	17 3 23.91	17.025	24 6 37.9	36.21	0 0.9
8	17 10 13.36	17.095	24 20 29.1	33.05	0 3.8
9	17 17 4.44	17.162	24 33 3.9	29.83	0 6.7
10	17 23 57.10	17.226	24 44 20.7	26.56	0 9.7
11	17 30 51.24	+ 17.285	− 24 54 18.2	− 23.23	0 12.6
12	17 37 46.77	17.341	25 2 55.2	19.84	0 15.6
13	17 44 43.58	17.392	25 10 10.3	16.40	0 18.6
14	17 51 41.54	17.437	25 16 2.1	12.91	0 21.7
15	17 58 40.51	17.476	25 20 29.4	9.36	0 24.7
16	18 5 40.33	+ 17.507	− 25 23 30.9	− 5.76	0 27.8
17	18 12 40.81	17.531	25 25 5.4	− 2.11	0 30.8
18	18 19 41.74	17.545	25 25 11.8	+ 1.59	0 33.9
19	18 26 42.89	17.549	25 23 49.0	5.32	0 37.0
20	18 33 44.03	17.543	25 20 56.1	9.09	0 40.1
21	18 40 44.86	+ 17.524	− 25 16 32.3	+ 12.90	0 43.2
22	18 47 45.07	17.491	25 10 36.7	16.74	0 46.3
23	18 54 44.31	17.443	25 3 8.8	20.60	0 49.3
24	19 1 42.19	17.378	24 54 8.2	24.46	0 52.3
25	19 8 38.26	17.293	24 43 34.8	28.33	0 55.3
26	19 15 32.04	+ 17.186	− 24 31 28.6	+ 32.19	0 58.3
27	19 22 22.99	17.056	24 17 50.0	36.03	1 1.2
28	19 29 10.49	16.898	24 2 39.7	39.82	1 4.0
29	19 35 53.84	16.709	23 45 58.8	43.56	1 6.8
30	19 42 32.26	16.485	23 27 49.1	47.23	1 9.5
31	19 49 4.86	+ 16.224	− 23 8 12.9	+ 50.78	1 12.1
32	19 55 30.65	+ 15.916	− 22 47 13.0	+ 54.17	1 14.6

Day of the Month.	2d.	7th.	12th.	17th.	22d.	27th.	32d.
	″	″	″	″	″	″	″
Semidiameter .	2.30	2.31	2.34	2.39	2.48	2.61	2.80
Hor. Parallax .	6.05	6.08	6.15	6.30	6.53	6.87	7.37

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing or south declinations are decreasing. The sign — indicates that north declinations are decreasing or south declinations increasing.

GREENWICH MEAN TIME.

JANUARY.

Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ′ ″	″	h m
1	16 42 38.67	+ 13.135	− 21 2 12.5	− 30.31	22 1.9
2	16 47 54.39	13.174	21 14 1.9	28.80	22 3.2
3	16 53 11.02	13.211	21 25 14.8	27.27	22 4.6
4	16 58 28.53	13.247	21 35 50.8	25.72	22 5.9
5	17 3 46.88	13.282	21 45 49.4	24.15	22 7.3
6	17 9 6.03	+ 13.314	− 21 55 10.0	− 22.56	22 8.7
7	17 14 25.94	13.345	22 3 52.2	20.95	22 10.1
8	17 19 46.56	13.373	22 11 55.5	19.32	22 11.5
9	17 25 7.85	13.400	22 19 19.6	17.68	22 12.9
10	17 30 29.76	13.425	22 26 4.1	16.02	22 14.3
11	17 35 52.24	+ 13.448	− 22 32 8.6	− 14.35	22 15.8
12	17 41 15.24	13.468	22 37 32.8	12.66	22 17.2
13	17 46 38.70	13.486	22 42 16.3	10.96	22 18.7
14	17 52 2.57	13.503	22 46 18.9	9.25	22 20.1
15	17 57 26.81	13.517	22 49 40.4	7.54	22 21.6
16	18 2 51.35	+ 13.528	− 22 52 20.6	− 5.81	22 23.0
17	18 8 16.13	13.537	22 54 19.2	4.07	22 24.5
18	18 13 41.09	13.543	22 55 36.1	2.33	22 26.0
19	18 19 6.16	13.546	22 56 11.2	− 0.59	22 27.5
20	18 24 31.29	13.548	22 56 4.4	+ 1.16	22 29.0
21	18 29 56.42	+ 13.546	− 22 55 15.7	+ 2.90	22 30.5
22	18 35 21.48	13.542	22 53 45.1	4.65	22 32.0
23	18 40 46.40	13.535	22 51 32.6	6.40	22 33.5
24	18 46 11.13	13.526	22 48 38.1	8.14	22 35.0
25	18 51 35.61	13.514	22 45 1.9	9.88	22 36.4
26	18 56 59.77	+ 13.499	− 22 40 44.1	+ 11.61	22 37.9
27	19 2 23.57	13.483	22 35 44.8	13.33	22 39.3
28	19 7 46.96	13.465	22 30 4.2	15.05	22 40.7
29	19 13 9.87	13.444	22 23 42.5	16.76	22 42.1
30	19 18 32.25	13.421	22 16 40.0	18.45	22 43.6
31	19 23 54.05	+ 13.396	− 22 8 56.9	+ 20.14	22 45.0
32	19 29 15.23	+ 13.370	− 22 0 33.6	+ 21.81	22 46.4

FEBRUARY.

Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ′ ″	″	h m
1	19 29 15.23	+ 13.370	− 22 0 33.6	+ 21.81	22 46.4
2	19 34 35.76	13.341	21 51 30.3	23.46	22 47.8
3	19 39 55.57	13.310	21 41 47.5	25.10	22 49.2
4	19 45 14.63	13.278	21 31 25.6	26.72	22 50.5
5	19 50 32.89	13.244	21 20 24.8	28.33	22 51.9
6	19 55 50.32	+ 13.209	− 21 8 45.7	+ 29.92	22 53.2
7	20 1 6.89	13.172	20 56 28.7	31.49	22 54.5
8	20 6 22.56	13.134	20 43 34.3	33.04	22 55.8
9	20 11 37.30	13.094	20 30 3.0	34.57	22 57.1
10	20 16 51.07	13.053	20 15 55.2	36.08	22 58.4
11	20 22 3.85	+ 13.011	− 20 1 11.5	+ 37.56	22 59.7
12	20 27 15.61	12.968	19 45 52.5	39.02	23 0.9
13	20 32 26.34	12.925	19 29 58.8	40.45	23 2.1
14	20 37 36.02	12.881	19 13 30.9	41.86	23 3.3
15	20 42 44.62	12.835	18 56 29.5	43.25	23 4.5
16	20 47 52.11	+ 12.789	− 18 38 55.2	+ 44.61	23 5.6
17	20 52 58.49	12.743	18 20 48.6	45.94	23 6.8
18	20 58 3.75	12.696	18 2 10.3	47.24	23 7.9
19	21 3 7.88	12.648	17 43 1.1	48.52	23 9.0
20	21 8 10.86	12.600	17 23 21.5	49.77	23 10.1
21	21 13 12.68	+ 12.552	− 17 3 12.3	+ 50.99	23 11.2
22	21 18 13.35	12.503	16 42 34.3	52.18	23 12.2
23	21 23 12.85	12.455	16 21 28.1	53.34	23 13.3
24	21 28 11.19	12.407	15 59 54.4	54.47	23 14.3
25	21 33 8.38	12.359	15 37 54.0	55.56	23 15.3
26	21 38 4.44	+ 12.312	− 15 15 27.6	+ 56.63	23 16.2
27	21 42 59.38	12.265	14 52 35.9	57.67	23 17.2
28	21 47 53.19	12.219	14 29 19.6	58.68	23 18.1
29	21 52 45.88	12.173	14 5 39.4	59.66	23 19.1
30	21 57 37.48	12.127	13 41 36.1	60.61	23 20.0
31	22 2 28.00	+ 12.083	− 13 17 10.5	+ 61.52	23 20.9
32	22 7 17.47	+ 12.040	− 12 52 23.3	+ 62.41	23 21.7

Day of the Month.	1st.	6th.	11th.	16th.	21st.	26th.	31st.
	″	″	″	″	″	″	″
Semidiameter.	6.04	5.94	5.85	5.76	5.68	5.60	5.53
Hor. Parallax.	6.22	6.12	6.02	5.93	5.85	5.77	5.70

Day of the Month.	5th.	10th.	15th.	20th.	25th.
	″	″	″	″	″
Semidiameter	5.46	5.40	5.35	5.29	5.24
Horizontal Parallax . .	5.63	5.56	5.50	5.45	5.40

NOTE.—The sign + indicates north declinations; the sign — indicates south declinations.

GREENWICH MEAN TIME.

MARCH.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	21 52 45.88	+12.173	−14 5 39.4	+59.66	23 19.1
2	21 57 37.48	12.127	13 41 36.1	60.61	23 20.0
3	22 2 28.00	12.083	13 17 10.5	61.52	23 20.9
4	22 7 17.47	12.040	12 52 23.3	62.41	23 21.7
5	22 12 5.91	11.997	12 27 15.1	63.27	23 22.6
6	22 16 53.34	+11.955	−12 1 46.8	+64.09	23 23.4
7	22 21 39.78	11.914	11 35 59.1	64.88	23 24.2
8	22 26 25.25	11.875	11 9 52.6	65.65	23 25.0
9	22 31 9.80	11.837	10 43 28.1	66.39	23 25.8
10	22 35 53.46	11.801	10 16 46.3	67.09	23 26.6
11	22 40 36.25	+11.765	− 9 49 48.0	+67.76	23 27.4
12	22 45 18.20	11.731	9 22 33.9	68.40	23 28.1
13	22 49 59.34	11.698	8 55 4.8	69.02	23 28.8
14	22 54 39.71	11.666	8 27 21.3	69.60	23 29.5
15	22 59 19.33	11.636	7 59 24.2	70.15	23 30.2
16	23 3 58.24	+11.607	− 7 31 14.3	+70.67	23 30.9
17	23 8 36.47	11.580	7 2 52.2	71.17	23 31.6
18	23 13 14.07	11.554	6 34 18.6	71.63	23 32.3
19	23 17 51.06	11.529	6 5 34.3	72.06	23 33.0
20	23 22 27.47	11.506	5 36 40.2	72.45	23 33.6
21	23 27 3.34	+11.484	− 5 7 37.1	+72.81	23 34.3
22	23 31 38.71	11.464	4 38 25.6	73.15	23 34.9
23	23 36 13.61	11.445	4 9 6.2	73.46	23 35.5
24	23 40 48.08	11.428	3 39 39.8	73.73	23 36.1
25	23 45 22.17	11.413	3 10 7.2	73.98	23 36.8
26	23 49 55.92	+11.399	− 2 40 29.1	+74.19	23 37.4
27	23 54 29.34	11.387	2 10 46.3	74.37	23 38.0
28	23 59 2.48	11.376	1 40 59.5	74.52	23 38.6
29	0 3 35.39	11.367	1 11 9.4	74.65	23 39.2
30	0 8 8.11	11.360	0 41 16.7	74.74	23 39.8
31	0 12 40.69	+11.355	− 0 11 22.0	+74.81	23 40.4
32	0 17 13.16	+11.351	+ 0 18 33.8	+74.84	23 41.0

APRIL.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	0 17 13.16	+11.351	+ 0 18 33.8	+74.84	23 41.0
2	0 21 45.57	11.350	0 48 30.1	74.84	23 41.6
3	0 26 17.96	11.350	1 18 26.2	74.81	23 42.2
4	0 30 50.37	11.352	1 48 21.3	74.76	23 42.8
5	0 35 22.85	11.355	2 18 14.8	74.68	23 43.4
6	0 39 55.44	+11.361	+ 2 48 5.9	+74.57	23 44.0
7	0 44 28.18	11.368	3 17 54.0	74.43	23 44.6
8	0 49 1.12	11.377	3 47 38.4	74.26	23 45.2
9	0 53 34.30	11.388	4 17 18.3	74.06	23 45.8
10	0 58 7.75	11.400	4 46 53.0	73.83	23 46.4
11	1 2 41.52	+11.414	+ 5 16 21.9	+73.57	23 47.1
12	1 7 15.66	11.431	5 45 44.2	73.28	23 47.7
13	1 11 50.21	11.449	6 14 59.2	72.96	23 48.3
14	1 16 25.20	11.468	6 44 6.2	72.61	23 48.9
15	1 21 0.67	11.489	7 13 4.4	72.23	23 49.6
16	1 25 36.66	+11.511	+ 7 41 53.1	+71.82	23 50.3
17	1 30 13.21	11.535	8 10 31.7	71.39	23 51.0
18	1 34 50.35	11.560	8 38 59.4	70.92	23 51.7
19	1 39 28.11	11.587	9 7 15.4	70.41	23 52.4
20	1 44 6.53	11.615	9 35 18.9	69.88	23 53.1
21	1 48 45.65	+11.645	+10 3 9.2	+69.31	23 53.8
22	1 53 25.49	11.676	10 30 45.6	68.72	23 54.5
23	1 58 6.08	11.708	10 58 7.3	68.09	23 55.3
24	2 2 47.46	11.741	11 25 13.5	67.43	23 56.0
25	2 7 29.65	11.775	11 52 3.5	66.73	23 56.8
26	2 12 12.68	+11.811	+12 18 36.5	+66.01	23 57.6
27	2 16 56.59	11.848	12 44 51.9	65.26	23 58.4
28	2 21 41.40	11.886	13 10 48.9	64.48	23 59.2
29	2 26 27.13	11.925	13 36 26.7	63.67	. . .
30	2 31 13.82	11.965	14 1 44.7	62.82	0 0.1
31	2 36 1.48	+12.006	+14 26 42.0	+61.95	0 0.9
32	2 40 50.14	+12.049	+14 51 18.0	+61.05	0 1.8

Day of the Month.	2d.	7th.	12th.	17th.	22d.	27th.
	″	″	″	″	″	″
Semidiameter . .	5.20	5.16	5.12	5.09	5.06	5.03
Hor. Parallax . .	5.35	5.31	5.27	5.24	5.21	5.18

Day of the Month.	1st.	6th.	11th.	16th.	21st.	26th.
	″	″	″	″	″	″
Semidiameter . .	5.01	4.99	4.97	4.96	4.95	4.94
Hor. Parallax . .	5.15	5.13	5.12	5.10	5.09	5.09

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing or south declinations are decreasing. The sign — indicates that north declinations are decreasing or south declinations increasing.

GREENWICH MEAN TIME.

MAY.						JUNE.					
Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.	Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
1	2 36 1.48	+ 12.006	+ 14 26 42.0	+ 61.95	0 0.9	1	5 13 27.38	+ 13.302	+ 23 25 22.0	+ 20.65	0 36.2
2	2 40 50.14	12.049	14 51 18.0	61.05	0 1.8	2	5 18 46.92	13.326	23 33 17.1	18.94	0 37.6
3	2 45 39.83	12.092	15 15 31.9	60.11	0 2.7	3	5 24 7.03	13.349	23 40 31.1	17.22	0 39.0
4	2 50 30.56	12.136	15 29 22.9	59.14	0 3.6	4	5 29 27.66	13 370	23 47 3.7	15.49	0 40.4
5	2 55 22.35	12.180	16 2 50.3	58.14	0 4.5	5	5 34 48.75	13.388	23 52 54.5	13.75	0 41.8
6	3 0 15.21	+ 12.225	+ 16 25 53.4	+ 57.12	0 5.5	6	5 40 10.24	+ 13.403	+ 23 58 3.4	+ 11.99	0 43.2
7	3 5 9.16	12.271	16 48 31.6	56.06	0 6.4	7	5 45 32.09	13.417	24 2 30.0	10.22	0 44.6
8	3 10 4.22	12.317	17 10 44.0	54.97	0 7.4	8	5 50 54.25	13.429	24 6 14.1	8.45	0 46.1
9	3 15 0.40	12.364	17 32 29.9	53.85	0 8.4	9	5 56 16.67	13.438	24 9 15.6	6.67	0 47.5
10	3 19 57.70	12.411	17 53 48.6	52.71	0 9.4	10	6 1 39.27	13.445	24 11 34.4	4.89	0 48.9
11	3 24 56.14	+ 12.459	+ 18 14 39.5	+ 51.53	0 10.4	11	6 7 1.99	+ 13.449	+ 24 13 10.3	+ 3.10	0 50.4
12	3 29 55.71	12.506	18 35 1.8	50.32	0 11.5	12	6 12 24.79	13.451	24 14 3.2	+ 1.31	0 51.8
13	3 34 56.42	12.554	18 54 54.8	49.09	0 12.5	13	6 17 47.60	13.450	24 14 13.1	− 0.48	0 53.2
14	3 39 58.28	12.601	19 14 17.9	47.83	0 13.6	14	6 23 10.36	13.447	24 13 39.9	2.28	0 54.6
15	3 45 1.26	12.648	19 33 10.2	46.53	0 14.7	15	6 28 33.01	13.441	24 12 23.6	4.07	0 56.1
16	3 50 5.36	+ 12.694	+ 19 51 31.1	+ 45.21	0 15.9	16	6 33 55.49	+ 13.432	+ 24 10 24.3	− 5.86	0 57.5
17	3 55 10.57	12.740	20 9 20.0	43.86	0 17.0	17	6 39 17.73	13.421	24 7 42.1	7.65	0 58.9
18	4 0 16.88	12.786	20 26 36.1	42.48	0 18.2	18	6 44 39.66	13.407	24 4 17.0	9.44	1 0.3
19	4 5 24.28	12.831	20 43 18.8	41.07	0 19.4	19	6 50 1.23	13.391	24 0 9.1	11.22	1 1.8
20	4 10 32.75	12.875	20 59 27.4	39.64	0 20.6	20	6 55 22.38	13.372	23 55 18.6	12.99	1 3.2
21	4 15 42.27	+ 12.918	+ 21 15 1.3	+ 38.18	0 21.8	21	7 0 43.04	+ 13.350	+ 23 49 45.7	− 14.75	1 4.6
22	4 20 52.81	12.960	21 29 59.9	36.70	0 23.0	22	7 6 3.15	13.326	23 43 30.7	16.50	1 6.0
23	4 26 4.35	13.001	21 44 22.7	35.19	0 24.2	23	7 11 22.66	13.300	23 36 33.8	18.24	1 7.4
24	4 31 16.85	13.040	21 58 9.0	33.66	0 25.5	24	7 16 41.51	13.271	23 28 55.3	19.97	1 8.8
25	4 36 30.28	13.078	22 11 18.2	32.10	0 26.8	25	7 21 59.65	13.240	23 20 35.4	21.68	1 10.1
26	4 41 44.61	+ 13.115	+ 22 23 49.8	+ 30.53	0 28.1	26	7 27 17.04	+ 13.208	+ 23 11 34.5	− 23.38	1 11.5
27	4 46 59.80	13.150	22 35 43.3	28.93	0 29.4	27	7 32 33.63	13.174	23 1 53.1	25.06	1 12.8
28	4 52 15.82	13.184	22 46 58.1	27.31	0 30.7	28	7 37 49.36	13.137	22 51 31.6	26.73	1 14.1
29	4 57 32.62	13.216	22 57 33.8	25.67	0 32.0	29	7 43 4.18	13.098	22 40 30.3	28.38	1 15.4
30	5 2 50.18	13.247	23 7 30.0	24.01	0 33.4	30	7 48 18.06	13.058	22 28 49.7	30.00	1 16.7
31	5 8 8.45	+ 13.276	+ 23 16 46.2	+ 22.34	0 34.8	31	7 53 30.96	+ 13.016	+ 22 16 30.3	− 31.61	1 17.9
32	5 13 27.38	+ 13.302	+ 23 25 22.0	+ 20.65	0 36.2	32	7 58 42.85	+ 12.973	+ 22 3 32.4	− 33.20	1 19.2

Day of the Month.	1st.	6th.	11th.	16th.	21st.	26th.	31st.
	″	″	″	″	″	″	″
Semidiameter.	4.94	4.94	4.95	4.96	4.97	4.99	5.01
Hor. Parallax.	5.09	5.09	5.09	5.10	5.12	5.14	5.16

Day of the Month.	5th.	10th.	15th.	20th.	25th.	30th.
	″	″	″	″	″	″
Semidiameter . .	5.04	5.07	5.11	5.15	5.20	5.25
Hor. Parallax . .	5.19	5.22	5.26	5.30	5.35	5.41

NOTE.—The sign + indicates north declinations; the sign − indicates south declinations.

GREENWICH MEAN TIME.

JULY.

Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″	h m
1	7 53 30.96	+13.016	+22 16 30.3	−31.61	1 17.9
2	7 58 42.85	12.973	22 3 32.4	33.20	1 19.2
3	8 3 53.69	12.929	21 49 56.7	34.76	1 20.5
4	8 9 3.45	12.883	21 35 43.8	36.30	1 21.7
5	8 14 12.11	12.836	21 20 54.1	37.82	1 22.9
6	8 19 19.64	+12.789	+21 5 28.2	−39.32	1 24.1
7	8 24 26.01	12.741	20 49 26.6	40.80	1 25.3
8	8 29 31.20	12.692	20 32 49.9	42.25	1 26.4
9	8 34 35.21	12.642	20 15 38.8	43.67	1 27.5
10	8 39 38.02	12.591	19 57 53.8	45.07	1 28.6
11	8 44 39.61	+12.540	+19 39 35.6	−46.44	1 29.7
12	8 49 39.96	12.488	19 20 44.8	47.78	1 30.8
13	8 54 39.07	12.436	19 1 22.0	49.11	1 31.8
14	8 59 36.93	12.384	18 41 27.9	50.40	1 32.8
15	9 4 33.54	12.332	18 21 3.3	51.66	1 33.8
16	9 9 28.90	+12.279	+18 0 8.9	−52.89	1 34.8
17	9 14 22.99	12.226	17 38 45.2	54.09	1 35.8
18	9 19 15.81	12.174	17 16 53.0	55.26	1 36.7
19	9 24 7.37	12.121	16 54 33.0	56.41	1 37.6
20	9 28 57.67	12.069	16 31 45.9	57.52	1 38.5
21	9 33 46.72	+12.017	+16 8 32.5	−58.60	1 39.4
22	9 38 34.54	11.966	15 44 53.5	59.65	1 40.3
23	9 43 21.12	11.915	15 20 49.6	60.68	1 41.1
24	9 48 6.48	11.864	14 56 21.5	61.67	1 41.9
25	9 52 50.63	11.814	14 31 30.0	62.63	1 42.7
26	9 57 33.60	+11.765	+14 6 15.9	−63.56	1 43.5
27	10 2 15.40	11.717	13 40 39.8	64.46	1 44.2
28	10 6 56.05	11.670	13 14 42.4	65.33	1 45.0
29	10 11 35.57	11.624	12 48 24.6	66.16	1 45.7
30	10 16 13.99	11.578	12 21 47.1	66.97	1 46.4
31	10 20 51.34	+11.534	+11 54 50.6	−67.75	1 47.0
32	10 25 27.64	+11.491	+11 27 35.7	−68.50	1 47.7

Day of the Month.	5th.	10th.	15th.	20th.	25th.	30th.
	″	″	″	″	″	″
Semidiameter . .	5.31	5.37	5.44	5.52	5.60	5.69
Hor. Parallax . .	5.47	5.53	5.60	5.68	5.77	5.86

AUGUST.

Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″	h m
1	10 25 27.64	+11.491	+11 27 35.7	−68.50	1 47.7
2	10 30 2.91	11.449	11 0 3.2	69.21	1 48.3
3	10 34 37.20	11.409	10 32 13.9	69.90	1 49.0
4	10 39 10.55	11.370	10 4 8.5	70.56	1 49.6
5	10 43 42.98	11.333	9 35 47.6	71.19	1 50.2
6	10 48 14.52	+11.297	+ 9 7 11.9	−71.79	1 50.8
7	10 52 45.21	11.262	8 38 22.1	72.36	1 51.4
8	10 57 15.10	11.229	8 9 19.0	72.90	1 51.9
9	11 1 44.21	11.197	7 40 3.3	73.41	1 52.5
10	11 6 12.57	11.167	7 10 35.6	73.90	1 53.1
11	11 10 40.23	+11.138	+ 6 40 56.5	−74.36	1 53.6
12	11 15 7.23	11.111	6 11 6.9	74.79	1 54.0
13	11 19 33.60	11.085	5 41 7.5	75.18	1 54.5
14	11 23 59.37	11.061	5 10 58.9	75.54	1 55.0
15	11 28 24.58	11.039	4 40 41.9	75.88	1 55.5
16	11 32 49.27	+11.018	+ 4 10 17.2	−76.19	1 55.9
17	11 37 13.48	10.999	3 39 45.5	76.46	1 56.4
18	11 41 37.25	10.981	3 9 7.4	76.71	1 56.8
19	11 46 0.61	10.965	2 38 23.7	76.93	1 57.3
20	11 50 23.60	10.950	2 7 35.0	77.12	1 57.7
21	11 54 46.25	+10.938	+ 1 36 42.2	−77.28	1 58.2
22	11 59 8.61	10.927	1 5 45.9	77.41	1 58.6
23	12 3 30.73	10.917	0 34 46.8	77.51	1 59.0
24	12 7 52.63	10.909	+ 0 3 45.7	77.58	1 59.4
25	12 12 14.35	10.902	− 0 27 16.8	77.63	1 59.9
26	12 16 35.93	+10.897	− 0 58 19.9	−77.65	2 0.3
27	12 20 57.42	10.894	1 29 23.1	77.63	2 0.7
28	12 25 18.85	10.893	2 0 25.6	77.58	2 1.1
29	12 29 40.27	10.893	2 31 26.6	77.51	2 1.5
30	12 34 1.72	10.895	3 2 25.6	77.41	2 1.9
31	12 38 23.24	+10.899	− 3 33 21.8	−77.28	2 2.3
32	12 42 44.87	+10.905	− 4 4 14.5	−77.12	2 2.7

Day of the Month.	4th.	9th.	14th.	19th.	24th.	29th.
	″	″	″	″	″	″
Semidiameter . .	5.79	5.89	6.01	6.13	6.26	6.40
Hor. Parallax . .	5.96	6.07	6.18	6.31	6.44	6.59

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing or south declinations are decreasing. The sign — indicates that north declinations are decreasing or south declinations increasing.

GREENWICH MEAN TIME.

SEPTEMBER.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	12 42 44.87	+ 10.905	− 4 4 14.5	− 77.12	2 2.7
2	12 47 6.67	10.912	4 35 3.2	76.93	2 3.1
3	12 51 28.66	10.921	5 5 47.1	76.72	2 3.6
4	12 55 50.89	10.932	5 36 25.5	76.48	2 4.0
5	13 0 13.40	10.945	6 6 57.8	76.21	2 4.5
6	13 4 36.24	+ 10.959	− 6 37 23.3	− 75.91	2 4.9
7	13 8 59.45	10.975	7 7 41.3	75.58	2 5.3
8	13 13 23.06	10.993	7 37 51.1	75.23	2 5.7
9	13 17 47.11	11.012	8 7 52.1	74.84	2 6.2
10	13 22 11.65	11.033	8 37 43.5	74.43	2 6.7
11	13 26 36.70	+ 11.055	− 9 7 24.6	− 73.99	2 7.2
12	13 31 2.30	11.079	9 36 54.8	73.52	2 7.7
13	13 35 28.48	11.104	10 6 13.4	73.02	2 8.2
14	13 39 55.28	11.130	10 35 19.6	72.49	2 8.7
15	13 44 22.73	11.157	11 4 12.7	71.93	2 9.2
16	13 48 50.85	+ 11.186	− 11 32 51.9	− 71.34	2 9.7
17	13 53 19.68	11.216	12 1 16.4	70.71	2 10.3
18	13 57 49.25	11.247	12 29 25.6	70.05	2 10.8
19	14 2 19.58	11.279	12 57 18.8	69.37	2 11.4
20	14 6 50.69	11.312	13 24 55.2	68.65	2 11.9
21	14 11 22.61	+ 11.346	− 13 52 14.1	− 67.91	2 12.5
22	14 15 55.36	11.382	14 19 14.7	67.13	2 13.1
23	14 20 28.96	11.418	14 45 56.3	66.32	2 13.8
24	14 25 3.43	11.455	15 12 18.1	65.48	2 14.4
25	14 29 38.80	11.493	15 38 19.4	64.62	2 15.1
26	14 34 15.08	+ 11.531	− 16 3 59.5	− 63.72	2 15.7
27	14 38 52.28	11.570	16 29 17.7	62.79	2 16.4
28	14 43 30.42	11.609	16 54 13.3	61.83	2 17.1
29	14 48 9.51	11.649	17 18 45.5	60.84	2 17.8
30	14 52 49.57	11.690	17 42 53.6	59.83	2 18.5
31	14 57 30.61	+ 11.731	− 18 6 36.9	− 58.78	2 19.3
32	15 2 12.65	+ 11.772	− 18 29 54.7	− 57.70	2 20.0

Day of the Month.	3d.	8th.	13th.	18th.	23d.	28th.
	″	″	″	″	″	″
Semidiameter .	6.55	6.71	6.88	7.06	7.26	7.47
Hor. Parallax .	6.74	6.90	7.08	7.27	7.47	7.69

OCTOBER.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	14 57 30.61	+ 11.731	− 18 6 36.9	− 58.78	2 19.3
2	15 2 12.65	11.772	18 29 54.7	57.70	2 20.0
3	15 6 55.68	11.814	18 52 46.4	56.59	2 20.8
4	15 11 39.72	11.856	19 15 11.3	55.46	2 21.6
5	15 16 24.77	11.898	19 37 8.7	54.30	2 22.4
6	15 21 10.84	+ 11.940	− 19 58 37.8	− 53.11	2 23.2
7	15 25 57.92	11.982	20 19 38.0	51.89	2 24.1
8	15 30 46.01	12.024	20 40 8.7	50.65	2 24.9
9	15 35 35.09	12.065	21 0 9.1	49.38	2 25.8
10	15 40 25.15	12.106	21 19 38.7	48.08	2 26.7
11	15 45 16.17	+ 12.146	− 21 38 36.7	− 46.75	2 27.6
12	15 50 8.15	12.185	21 57 2.5	45.39	2 28.5
13	15 55 1.06	12.223	22 14 55.5	44.01	2 29.5
14	15 59 54.87	12.260	22 32 15.1	42.61	2 30.4
15	16 4 49.55	12.296	22 49 0.6	41.18	2 31.4
16	16 9 45.08	+ 12.330	− 23 5 11.4	− 39.72	2 32.4
17	16 14 41.43	12.363	23 20 47.0	38.24	2 33.4
18	16 19 38.54	12.394	23 35 46.8	36.74	2 34.4
19	16 24 36.36	12.423	23 50 10.2	35.21	2 35.4
20	16 29 34.86	12.450	24 3 56.7	33.66	2 36.4
21	16 34 33.99	+ 12.475	− 24 17 5.8	− 32.09	2 37.5
22	16 39 33.70	12.498	24 29 36.9	30.50	2 38.5
23	16 44 33.93	12.518	24 41 29.7	28.89	2 39.6
24	16 49 34.63	12.536	24 52 43.7	27.27	2 40.7
25	16 54 35.73	12.552	25 3 18.6	25.63	2 41.8
26	16 59 37.17	+ 12.565	− 25 13 14.0	− 23.98	2 42.9
27	17 4 38.89	12.575	25 22 29.5	22.31	2 44.0
28	17 9 40.84	12.583	25 31 4.8	20.63	2 45.0
29	17 14 42.94	12.589	25 38 59.6	18.93	2 46.1
30	17 19 45.13	12.592	25 46 13.7	17.23	2 47.2
31	17 24 47.34	+ 12.592	− 25 52 46.9	− 15.52	2 48.3
32	17 29 49.52	+ 12.589	− 25 58 39.0	− 13.81	2 49.4

Day of the Month.	3d.	8th.	13th.	18th.	23d.	28th.
	″	″	″	″	″	″
Semidiameter .	7.70	7.95	8.22	8.51	8.82	9.16
Hor. Parallax .	7.93	8.19	8.46	8.76	9.08	9.44

NOTE.—The sign + indicates north declinations; the sign − indicates south declinations.

GREENWICH MEAN TIME.

NOVEMBER.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	17 29 49.52	+ 12.589	− 25 58 39.0	− 13.81	2 49.4
2	17 34 51.57	12.583	26 3 49.8	12.09	2 50.5
3	17 39 53.44	12.574	26 8 19.3	10.37	2 51.6
4	17 44 55.06	12.561	26 12 7.3	8.64	2 52.7
5	17 49 56.34	12.545	26 15 13.8	6.91	2 53.8
6	17 54 57.20	+ 12.526	− 26 17 38.8	− 5.18	2 54.8
7	17 59 57.57	12.504	26 19 22.3	3.45	2 55.9
8	18 4 57.37	12.479	26 20 24.3	− 1.72	2 57.0
9	18 9 56.51	12.450	26 20 45.0	+ 0.00	2 58.0
10	18 14 54.91	12.417	26 20 24.3	1.72	2 59.0
11	18 19 52.48	+ 12.380	− 26 19 22.4	+ 3.43	3 0.0
12	18 24 49.13	12.340	26 17 39.6	5.13	3 1.0
13	18 29 44.78	12.297	26 15 16.0	6.83	3 2.0
14	18 34 39.34	12.250	26 12 11.9	8.51	3 3.0
15	18 39 32.72	12.199	26 8 27.7	10.17	3 4.0
16	18 44 24.83	+ 12.144	− 26 4 3.5	+ 11.83	3 4.9
17	18 49 15.58	12.085	25 58 59.7	13.48	3 5.8
18	18 54 4.88	12.023	25 53 16.7	15.10	3 6.6
19	18 58 52.65	11.957	25 46 55.1	16.70	3 7.5
20	19 3 38.78	11.887	25 39 55.2	18.28	3 8.3
21	19 8 23.19	+ 11.813	− 25 32 17.5	+ 19.84	3 9.1
22	19 13 5.79	11.736	25 24 2.6	21.38	3 9.9
23	19 17 46.50	11.656	25 15 11.0	22.90	3 10.6
24	19 22 25.23	11.572	25 5 43.2	24.40	3 11.3
25	19 27 1.90	11.485	24 55 40.0	25.86	3 12.0
26	19 31 36.43	+ 11.394	− 24 45 2.0	+ 27.30	3 12.6
27	19 36 8.75	11.300	24 33 49.8	28.71	3 13.2
28	19 40 38.80	11.204	24 22 4.1	30.08	3 13.7
29	19 45 6.49	11.104	24 9 45.7	31.43	3 14.2
30	19 49 31.74	11.001	23 56 55.3	32.75	3 14.7
31	19 53 54.49	+ 10.895	− 23 43 33.6	+ 34.03	3 15.1
32	19 58 14.67	+ 10.787	− 23 29 41.3	+ 35.29	3 15.5

Day of the Month.	2d.	7th.	12th.	17th.	22d.	27th.
	″	″	″	″	″	″
Semidiameter . .	9.54	9.94	10.40	10.88	11.43	12.03
Hor. Parallax . .	9.82	10.24	10.70	11.20	11.77	12.39

DECEMBER.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	19 53 54.49	+ 10.895	− 23 43 33.6	+ 34.03	3 15.1
2	19 58 14.67	10.787	23 29 41.3	35.29	3 15.5
3	20 2 32.22	10.676	23 15 19.4	36.51	3 15.9
4	20 6 47.08	10.562	23 0 28.6	37.70	3 16.2
5	20 10 59.17	10.446	22 45 9.7	38.85	3 16.5
6	20 15 8.42	+ 10.326	− 22 29 23.6	+ 39.96	3 16.7
7	20 19 14.76	10.203	22 13 11.2	41.04	3 16.8
8	20 23 18.12	10.078	21 56 33.3	42.08	3 16.9
9	20 27 18.44	9.949	21 39 30.8	43.08	3 17.0
10	20 31 15.62	9.817	21 22 4.7	44.05	3 17.0
11	20 35 9.59	+ 9.681	− 21 4 15.9	+ 44.97	3 16.9
12	20 39 0.28	9.543	20 46 5.4	45.86	3 16.8
13	20 42 47.61	9.401	20 27 34.1	46.70	3 16.6
14	20 46 31.49	9.256	20 8 43.1	47.50	3 16.4
15	20 50 11.84	9.107	19 49 33.5	48.26	3 16.1
16	20 53 48.56	+ 8.954	− 19 30 6.2	+ 48.97	3 15.8
17	20 57 21.57	8.797	19 10 22.3	49.64	3 15.4
18	21 0 50.77	8.636	18 50 22.8	50.27	3 14.9
19	21 4 16.06	8.471	18 30 8.9	50.84	3 14.4
20	21 7 37.33	8.301	18 9 41.9	51.37	3 13.8
21	21 10 54.48	+ 8.127	− 17 49 2.9	+ 51.84	3 13.1
22	21 14 7.40	7.949	17 28 13.1	52.27	3 12.4
23	21 17 15.98	7.766	17 7 13.6	52.65	3 11.6
24	21 20 20.12	7.578	16 46 5.6	52.97	3 10.7
25	21 23 19.70	7.386	16 24 50.5	53.24	3 9.7
26	21 26 14.59	+ 7.188	− 16 3 29.5	+ 53.46	3 8.7
27	21 29 4.68	6.986	15 42 3.8	53.63	3 7.6
28	21 31 49.86	6.778	15 20 34.7	53.74	3 6.4
29	21 34 29.99	6.565	14 59 3.5	53.80	3 5.1
30	21 37 4.94	6.346	14 37 31.6	53.80	3 3.7
31	21 39 34.57	+ 6.123	− 14 16 0.3	+ 53.75	3 2.3
32	21 41 58.76	+ 5.894	− 13 54 31.1	+ 53.63	3 0.8

Day of the Month.	2d.	7th.	12th.	17th.	22d.	27th.	32d.
	″	″	″	″	″	″	″
Semidiameter .	12.71	13.45	14.29	15.24	16.29	17.50	18.85
Hor. Parallax .	13.09	13.86	14.71	15.69	16.78	18.01	19.40

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing or south declinations are decreasing. The sign − indicates that north declinations are decreasing or south declinations increasing.

GREENWICH MEAN TIME.

JANUARY.

Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″	h m
1	15 28 4.29	+6.734	−18 21 39.0	−25.66	20 44.9
2	15 30 46.09	6.750	18 31 50.7	25.31	20 43.6
3	15 33 28.27	6.766	18 41 54.0	24.95	20 42.4
4	15 36 10.82	6.782	18 51 48.9	24.60	20 41.2
5	15 38 53.74	6.797	19 1 35.3	24.24	20 40.0
6	15 41 37.04	+6.812	−19 11 13.1	−23.89	20 38.8
7	15 44 20.72	6.827	19 20 42.2	23.53	20 37.6
8	15 47 4.77	6.842	19 30 2.5	23.16	20 36.4
9	15 49 49.19	6.857	19 39 13.9	22.79	20 35.2
10	15 52 33.99	6.873	19 48 16.3	22.41	20 33.9
11	15 55 19.15	+6.889	−19 57 9.6	−22.03	20 32.7
12	15 58 4.68	6.904	20 5 53.7	21.64	20 31.5
13	16 0 50.58	6.919	20 14 28.5	21.25	20 30.3
14	16 3 36.84	6.934	20 22 53.9	20.86	20 29.2
15	16 6 23.45	6.949	20 31 9.9	20.46	20 28.1
16	16 9 10.41	+6.964	−20 39 16.3	−20.06	20 26.9
17	16 11 57.72	6.978	20 47 13.0	19.65	20 25.8
18	16 14 45.37	6.992	20 54 59.9	19.24	20 24.7
19	16 17 33.35	7.006	21 2 37.0	18.83	20 23.6
20	16 20 21.66	7.019	21 10 4.1	18.42	20 22.5
21	16 23 10.29	+7.033	−21 17 21.0	−18.00	20 21.3
22	16 25 59.23	7.046	21 24 27.8	17.58	20 20.2
23	16 28 48.48	7.059	21 31 24.4	17.15	20 19.1
24	16 31 38.02	7.072	21 38 10.6	16.72	20 18.0
25	16 34 27.86	7.084	21 44 46.5	16.28	20 16.9
26	16 37 17.99	+7.096	−21 51 11.9	−15.84	20 15.8
27	16 40 8.41	7.108	21 57 26.8	15.40	20 14.7
28	16 42 59.11	7.119	22 3 31.0	14.96	20 13.6
29	16 45 50.07	7.130	22 9 24.5	14.51	20 12.5
30	16 48 41.31	7.141	22 15 7.2	14.06	20 11.5
31	16 51 32.82	+7.152	−22 20 39.2	−13.61	20 10.4
32	16 54 24.59	+7.163	−22 26 0.3	−13.16	20 9.3

Day of the Month.	1st.	6th.	11th.	16th.	21st.	26th.	31st.
	″	″	″	″	″	″	″
Semidiameter	2.39	2.43	2.48	2.53	2.58	2.64	2.70
Hor. Parallax	4.16	4.24	4.32	4.41	4.50	4.60	4.71

FEBRUARY.

Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″	h m
1	16 54 24.59	+7.163	−22 26 0.3	−13.16	20 9.3
2	16 57 16.61	7.174	22 31 10.5	12.70	20 8.3
3	17 0 8.89	7.184	22 36 9.7	12.24	20 7.2
4	17 3 1.41	7.194	22 40 57.9	11.78	20 6.2
5	17 5 54.18	7.204	22 45 34.9	11.31	20 5.2
6	17 8 47.20	+7.213	−22 50 0.9	−10.84	20 4.2
7	17 11 40.46	7.222	22 54 15.7	10.37	20 3.1
8	17 14 33.94	7.231	22 58 19.2	9.90	20 2.0
9	17 17 27.62	7.240	23 2 11.4	9.43	20 0.9
10	17 20 21.49	7.249	23 5 52.3	8.96	19 59.9
11	17 23 15.55	+7.257	−23 9 21.8	− 8.49	19 58.9
12	17 26 9.80	7.265	23 12 39.8	8.01	19 57.8
13	17 29 4.24	7.272	23 15 46.4	7.53	19 56.8
14	17 31 58.86	7.279	23 18 41.4	7.05	19 55.7
15	17 34 53.64	7.285	23 21 24.8	6.57	19 54.7
16	17 37 48.56	+7.291	−23 23 56.7	− 6.09	19 53.7
17	17 40 43.62	7.296	23 26 17.0	5.61	19 52.6
18	17 43 38.80	7.301	23 28 25.7	5.12	19 51.6
19	17 46 34.08	7.305	23 30 22.7	4.63	19 50.6
20	17 49 29.45	7.309	23 32 8.0	4.14	19 49.5
21	17 52 24.91	+7.312	−23 33 41.5	− 3.66	19 48.6
22	17 55 20.45	7.315	23 35 3.3	3.18	19 47.5
23	17 58 16.05	7.318	23 36 13.4	2.69	19 46.5
24	18 1 11.71	7.320	23 37 11.7	2.20	19 45.5
25	18 4 7.41	7.322	23 37 58.3	1.71	19 44.5
26	18 7 3.15	+7.323	−23 38 33.2	− 1.21	19 43.5
27	18 9 58.92	7.324	23 38 56.3	0.72	19 42.4
28	18 12 54.72	7.325	23 39 7.7	− 0.23	19 41.4
29	18 15 50.53	7.326	23 39 7.4	+ 0.26	19 40.4
30	18 18 46.36	7.326	23 38 55.3	0.75	19 39.4
31	18 21 42.19	+7.325	−23 38 31.5	+ 1.24	19 38.4
32	18 24 38.01	+7.325	−23 37 56.1	+ 1.73	19 37.4

Day of the Month.	5th.	10th.	15th.	20th.	25th.
	″	″	″	″	″
Semidiameter	2.76	2.83	2.90	2.97	3.05
Horizontal Parallax . .	4.82	4.93	5.05	5.18	5.32

NOTE.—The sign + indicates north declinations; the sign — indicates south declinations.

GREENWICH MEAN TIME.

	MARCH.						APRIL.				
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	*Noon.*	*Noon.*	*Noon.*			*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
1	18 15 50.53	+7.326	−23 39 7.4	+ 0.26	19 40.4	1	19 45 58.36	+7.144	−22 4 58.0	+14.55	19 8.4
2	18 18 46.36	7.326	23 38 55.3	0.75	19 39.4	2	19 48 49.68	7.132	21 59 3.9	14.96	19 7.3
3	18 21 42.19	7.325	23 38 31.5	1.24	19 38.4	3	19 51 40.72	7.120	21 52 59.9	15.37	19 6.2
4	18 24 38.01	7.325	23 37 56.1	1.73	19 37.4	4	19 54 31.47	7.108	21 46 46.2	15.77	19 5.1
5	18 27 33.82	7.324	23 37 9.0	2.21	19 36.4	5	19 57 21.92	7.096	21 40 22.8	16.17	19 4.0
6	18 30 29.60	+7.323	−23 36 10.3	+ 2.69	19 35.4	6	20 0 12.08	+7.083	−21 33 49.8	+16.57	19 2.9
7	18 33 25.35	7.322	23 35 0.0	3.17	19 34.4	7	20 3 1.93	7.070	21 27 7.4	16.96	19 1.8
8	18 36 21.06	7.320	23 33 38.2	3.65	19 33.4	8	20 5 51.48	7.057	21 20 15.6	17.35	19 0.7
9	18 39 16.73	7.318	23 32 4.8	4.13	19 32.4	9	20 8 40.71	7.044	21 13 14.5	17.73	18 59.5
10	18 42 12.35	7.315	23 30 19.8	4.61	19 31.3	10	20 11 29.61	7.031	21 6 4.4	18.11	18 58.3
11	18 45 7.89	+7.312	−23 28 23.4	+ 5.09	19 30.3	11	20 14 18.18	+7.017	−20 58 45.3	+18.48	18 57.2
12	18 48 3.35	7.309	23 26 15.5	5.57	19 29.3	12	20 17 6.40	7.002	20 51 17.4	18.84	18 56.1
13	18 50 58.73	7.305	23 23 56.1	6.04	19 28.3	13	20 19 54.27	6.987	20 43 40.8	19.20	18 54.9
14	18 53 54.00	7.300	23 21 25.4	6.51	19 27.2	14	20 22 41.78	6.972	20 35 55.5	19.56	18 53.7
15	18 56 49.16	7.295	23 18 43.4	6.98	19 26.2	15	20 25 28.91	6.956	20 28 1.7	19.91	18 52.5
16	18 59 44.20	+7.290	−23 15 50.1	+ 7.45	19 25.2	16	20 28 15.66	+6.940	−20 19 59.5	+20.26	18 51.4
17	19 2 39.10	7.284	23 12 45.6	7.92	19 24.2	17	20 31 2.01	6.923	20 11 49.2	20.60	18 50.2
18	19 5 33.85	7.277	23 9 29.8	8.38	19 23.2	18	20 33 47.96	6.906	20 3 30.8	20.93	18 49.1
19	19 8 28.43	7.270	23 6 2.9	8.84	19 22.1	19	20 36 33.49	6.889	19 55 4.6	21.26	18 47.9
20	19 11 22.84	7.262	23 2 25.1	9.30	19 21.1	20	20 39 18.60	6.871	19 46 30.6	21.58	18 46.7
21	19 14 17.06	+7.254	−22 58 36.3	+ 9.76	19 20.1	21	20 42 3.28	+6.853	−19 37 49.0	+21.89	18 45.5
22	19 17 11.08	7.246	22 54 36.6	10.22	19 19.1	22	20 44 47.53	6.835	19 28 59.9	22.19	18 44.3
23	19 20 4.88	7.237	22 50 26.0	10.67	19 18.0	23	20 47 31.34	6.817	19 20 3.6	22.49	18 43.1
24	19 22 58.47	7.228	22 46 4.8	11.11	19 17.0	24	20 50 14.70	6.798	19 11 0.1	22.78	18 41.9
25	19 25 51.82	7.218	22 41 32.9	11.55	19 15.9	25	20 52 57.62	6.779	19 1 49.6	23.07	18 40.6
26	19 28 44.94	+7.208	−22 36 50.4	+11.99	19 14.9	26	20 55 40.08	+6.760	−18 52 32.2	+23.36	18 39.4
27	19 31 37.82	7.198	22 31 57.4	12.43	19 13.9	27	20 58 22.10	6.741	18 43 8.2	23.64	18 38.2
28	19 34 30.45	7.188	22 26 53.9	12.86	19 12.8	28	21 1 3.67	6.722	18 33 37.6	23.91	18 36.9
29	19 37 22.82	7.177	22 21 40.2	13.29	19 11.7	29	21 3 44.79	6.703	18 24 0.6	24.18	18 35.6
30	19 40 14.93	7.166	22 16 16.2	13.71	19 10.6	30	21 6 25.45	6.684	18 14 17.2	24.44	18 34.3
31	19 43 6.78	+7.155	−22 10 42.1	+14.13	19 9.5	31	21 9 5.66	+6.665	−18 4 27.7	+24.69	18 33.0
32	19 45 58.36	+7.144	−22 4 58.0	+14.55	19 8.4	32	21 11 45.40	+6.646	−17 54 32.2	+24.93	18 31.7

Day of the Month.	2d.	7th.	12th.	17th.	22d.	27th.	Day of the Month.	1st.	6th.	11th.	16th.	21st.	26th.
	″	″	″	″	″	″		″	″	″	″	″	″
Semidiameter . .	3.13	3.22	3.31	3.41	3.51	3.61	Semidiameter . .	3.72	3.84	3.97	4.10	4.24	4.39
Hor. Parallax . .	5.46	5.61	5.77	5.94	6.11	6.30	Hor. Parallax . .	6.49	6.69	6.91	7.14	7.38	7.63

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing or south declinations are decreasing. The sign — indicates that north declinations are decreasing or south declinations increasing.

GREENWICH MEAN TIME.

MAY.						JUNE.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	*Noon.*	*Noon.*	*Noon.*			*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
1	21 9 5.66	+6.665	−18 4 27.7	+24.69	18 33.0	1	22 27 32.83	+5.943	−12 24 58.4	+28.80	17 49.1
2	21 11 45.40	6.646	17 54 32.2	24.93	18 31.7	2	22 29 55.14	5.915	12 13 27.0	28.81	17 47.5
3	21 14 24.68	6.627	17 44 30.9	25.17	18 30.4	3	22 32 16.78	5.887	12 1 55.5	28.81	17 45.9
4	21 17 3.49	6.608	17 34 24.0	25.40	18 29.1	4	22 34 37.75	5.859	11 50 24.0	28.80	17 44.3
5	21 19 41.83	6.588	17 24 11.6	25.63	18 27.8	5	22 36 58.05	5.831	11 38 52.9	28.79	17 42.7
6	21 22 19.70	+6.568	−17 13 53.8	+25.85	18 26.5	6	22 39 17.65	+5.802	−11 27 22.3	+28.76	17 41.1
7	21 24 57.09	6.548	17 3 30.7	26.06	18 25.2	7	22 41 36.55	5.772	11 15 52.5	28.72	17 39.5
8	21 27 34.00	6.528	16 53 2.6	26.26	18 23.9	8	22 43 54.74	5.742	11 4 23.6	28.67	17 37.8
9	21 30 10.42	6.507	16 42 29.7	26.46	18 22.6	9	22 46 12.20	5.711	10 52 56.0	28.62	17 36.1
10	21 32 46.33	6.486	16 31 52.1	26.65	18 21.2	10	22 48 28.91	5.680	10 41 29.8	28.56	17 34.4
11	21 35 21.74	+6.465	−16 21 10.0	+26.84	18 19.9	11	22 50 44.85	+5.648	−10 30 5.3	+28.48	17 32.7
12	21 37 56.63	6.443	16 10 23.6	27.02	18 18.5	12	22 53 0.01	5.615	10 18 42.8	28.39	17 31.0
13	21 40 30.99	6.421	15 59 33.1	27.19	18 17.1	13	22 55 14.36	5.581	10 7 22.5	28.29	17 29.3
14	21 43 4.82	6.398	15 48 38.6	27.35	18 15.7	14	22 57 27.88	5.546	−9 56 4.7	28.18	17 27.6
15	21 45 38.10	6.375	15 37 40.5	27.50	18 14.3	15	22 59 40.57	5.511	9 44 49.7	28.06	17 25.9
16	21 48 10.81	+6.351	−15 26 38.9	+27.64	18 12.9	16	23 1 52.41	+5.475	− 9 33 37.6	+27.93	17 24.2
17	21 50 42.96	6.327	15 15 34.0	27.77	18 11.5	17	23 4 3.36	5.438	9 22 28.7	27.79	17 22.4
18	21 53 14.53	6.303	15 4 25.9	27.89	18 10.1	18	23 6 13.42	5.400	9 11 23.3	27.64	17 20.6
19	21 55 45.52	6.279	14 53 15.0	28.00	18 8.7	19	23 8 22.57	5.362	9 0 21.7	27.48	17 18.8
20	21 58 15.92	6.254	14 42 1.5	28.11	18 7.2	20	23 10 30.80	5.323	8 49 24.0	27.32	17 17.0
21	22 0 45.71	+6.229	−14 30 45.5	+28.21	18 5.8	21	23 12 38.09	+5.283	− 8 38 30.4	+27.15	17 15.2
22	22 3 14.90	6.204	14 19 27.2	28.30	18 4.3	22	23 14 44.42	5.243	8 27 41.1	26.97	17 13.4
23	22 5 43.48	6.179	14 8 6.8	28.38	18 2.8	23	23 16 49.79	5.202	8 16 56.4	26.78	17 11.5
24	22 8 11.45	6.153	13 56 44.4	28.45	18 1.3	24	23 18 54.19	5.161	8 6 16.4	26.57	17 9.6
25	22 10 38.81	6.127	13 45 20.3	28.52	17 59.8	25	23 20 57.59	5.120	7 55 41.4	26.35	17 7.7
26	22 13 5.56	+6.101	−13 33 54.7	+28.59	17 58.3	26	23 22 59.97	+5.078	− 7 45 11.6	+26.13	17 5.8
27	22 15 31.68	6.075	13 22 27.8	28.65	17 56.8	27	23 25 1.32	5.035	7 34 47.2	25.90	17 3.8
28	22 17 57.17	6.049	13 10 59.6	28.70	17 55.3	28	23 27 1.62	4.991	7 24 28.4	25.66	17 1.9
29	22 20 22.04	6.023	12 59 30.3	28.74	17 53.8	29	23 29 0.86	4.946	7 14 15.3	25.42	16 59.9
30	22 22 46.27	5.997	12 48 0.3	28.77	17 52.2	30	23 30 59.01	4.900	7 4 8.2	25.17	16 57.9
31	22 25 9.87	+5.970	−12 36 29.6	+28.79	17 50.7	31	23 32 56.06	+4.853	− 6 54 7.3	+24.91	16 55.9
32	22 27 32.83	+5.943	−12 24 58.4	+28.80	17 49.1	32	23 34 51.98	+4.805	− 6 44 13.0	+24.64	16 53.9

Day of the Month.	1st.	6th.	11th.	16th.	21st.	26th.	31st.
	″	″	″	″	″	″	″
Semidiameter.	4.54	4.70	4.87	5.05	5.24	5.44	5.66
Hor. Parallax.	7.90	8.18	8.48	8.80	9.13	9.48	9.85

Day of the Month.	5th.	10th.	15th.	20th.	25th.	30th.
	″	″	″	″	″	″
Semidiameter . .	5.88	6.11	6.37	6.65	6.93	7.24
Hor. Parallax . .	10.25	10.67	11.11	11.58	12.09	12.62

NOTE.—The sign + indicates north declinations; the sign — indicates south declinations.

GREENWICH MEAN TIME.

JULY.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	23 32 56.06	+4.853	−6 54 7.3	+24.91	16 55.9
2	23 34 51.98	4.805	6 44 13.0	24.64	16 53.9
3	23 36 46.74	4.756	6 34 25.5	24.35	16 51.8
4	23 38 40.31	4.706	6 24 44.9	24.05	16 49.8
5	23 40 32.68	4.656	6 15 11.4	23.74	16 47.7
6	23 42 23.81	+4.604	−6 5 45.3	+23.42	16 45.6
7	23 44 13.66	4.550	5 56 27.0	23.09	16 43.5
8	23 46 2.18	4.494	5 47 16.7	22.75	16 41.4
9	23 47 49.35	4.436	5 38 14.7	22.40	16 39.2
10	23 49 35.12	4.377	5 29 21.2	22.04	16 37.0
11	23 51 19.47	+4.317	−5 20 36.7	+21.67	16 34.8
12	23 53 2.35	4.255	5 12 1.4	21.28	16 32.6
13	23 54 43.71	4.191	5 3 35.6	20.88	16 30.3
14	23 56 23.52	4.125	4 55 19.6	20.46	16 28.0
15	23 58 1.74	4.058	4 47 13.7	20.03	16 25.7
16	23 59 38.32	+3.990	−4 39 18.1	+19.59	16 23.3
17	0 1 13.23	3.920	4 31 33.1	19.14	16 20.9
18	0 2 46.42	3.848	4 23 58.9	18.69	16 18.5
19	0 4 17.87	3.774	4 16 35.8	18.23	16 16.1
20	0 5 47.54	3.698	4 9 23.9	17.76	16 13.6
21	0 7 15.39	+3.621	−4 2 23.5	+17.28	16 11.1
22	0 8 41.38	3.543	3 55 34.7	16.79	16 8.6
23	0 10 5.46	3.463	3 48 57.8	16.29	16 6.1
24	0 11 27.60	3.382	3 42 32.9	15.78	16 3.5
25	0 12 47.78	3.299	3 36 20.3	15.26	16 0.8
26	0 14 5.95	+3.214	−3 30 20.2	+14.73	15 58.1
27	0 15 22.06	3.127	3 24 32.7	14.20	15 55.4
28	0 16 36.07	3.039	3 18 58.1	13.66	15 52.7
29	0 17 47.94	2.949	3 13 36.5	13.12	15 50.0
30	0 18 57.62	2.857	3 8 28.1	12.57	15 47.2
31	0 20 5.06	+2.764	−3 3 33.1	+12.01	15 44.3
32	0 21 10.21	+2.668	−2 58 51.6	+11.44	15 41.4

Day of the Month.	5th.	10th.	15th.	20th.	25th.	30th.
	″	″	″	″	″	″
Semidiameter	7.56	7.90	8.26	8.65	9.05	9.48
Hor. Parallax	13.18	13.76	14.39	15.06	15.76	16.49

AUGUST.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	0 21 10.21	+2.668	−2 58 51.6	+11.44	15 41.4
2	0 22 13.03	2.569	2 54 24.0	10.86	15 38.5
3	0 23 13.46	2.467	2 50 10.4	10.27	15 35.6
4	0 24 11.43	2.363	2 46 11.1	9.67	15 32.6
5	0 25 6.88	2.258	2 42 26.4	9.06	15 29.6
6	0 25 59.77	+2.150	−2 38 56.5	+ 8.44	15 26.5
7	0 26 50.04	2.039	2 35 41.5	7.81	15 23.4
8	0 27 37.62	1.925	2 32 41.7	7.17	15 20.2
9	0 28 22.44	1.809	2 29 57.4	6.52	15 17.0
10	0 29 4.45	1.691	2 27 28.7	5.86	15 13.7
11	0 29 43.60	+1.571	−2 25 15.8	+ 5.20	15 10.4
12	0 30 19.82	1.449	2 23 18.9	4.54	15 7.0
13	0 30 53.09	1.325	2 21 37.9	3.87	15 3.6
14	0 31 23.36	1.198	2 20 12.9	3.20	15 0.1
15	0 31 50.59	1.070	2 19 4.0	2.53	14 56.6
16	0 32 14.75	+0.941	−2 18 11.0	+ 1.87	14 53.0
17	0 32 35.81	0.811	2 17 33.9	1.21	14 49.4
18	0 32 53.74	0.680	2 17 12.8	+ 0.55	14 45.8
19	0 33 8.51	0.549	2 17 7.5	− 0.11	14 42.1
20	0 33 20.09	0.417	2 17 17.9	0.76	14 38.3
21	0 33 28.48	+0.284	−2 17 43.7	− 1.40	14 34.5
22	0 33 33.67	0.150	2 18 24.8	2.03	14 30.6
23	0 33 35.64	+0.015	2 19 21.0	2.65	14 26.7
24	0 33 34.39	−0.120	2 20 32.0	3.26	14 22.7
25	0 33 29.92	0.254	2 21 57.5	3.86	14 18.7
26	0 33 22.23	−0.388	−2 23 37.2	− 4.44	14 14.6
27	0 33 11.34	0.521	2 25 30.8	5.01	14 10.4
28	0 32 57.27	0.653	2 27 37.9	5.57	14 6.2
29	0 32 40.03	0.784	2 29 58.2	6.11	14 1.9
30	0 32 19.64	0.914	2 32 31.2	6.63	13 57.6
31	0 31 56.12	−1.044	−2 35 16.6	− 7.13	13 53.3
32	0 31 29.50	−1.173	−2 38 14.0	− 7.61	13 48.9

Day of the Month.	4th.	9th.	14th.	19th.	24th.	29th.
	″	″	″	″	″	″
Semidiameter	9.91	10.35	10.80	11.26	11.70	12.10
Hor. Parallax	17.25	18.03	18.82	19.61	20.37	21.07

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing or south declinations are decreasing. The sign — indicates that north declinations are decreasing or south declinations increasing.

GREENWICH MEAN TIME.

SEPTEMBER.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	0 31 29.50	−1.173	−2 38 14.0	− 7.61	13 48.9
2	0 30 59.81	1.301	2 41 22.6	8.07	13 44.5
3	0 30 27.10	1.427	2 44 42.0	8.52	13 40.0
4	0 29 51.41	1.550	2 48 11.8	8.94	13 35.4
5	0 29 12.80	1.670	2 51 51.5	9.33	13 30.8
6	0 28 31.33	−1.786	−2 55 40.6	− 9.70	13 26.2
7	0 27 47.09	1.899	2 59 38.2	10.04	13 21.5
8	0 27 0.17	2.009	3 3 43.5	10.36	13 16.8
9	0 26 10.68	2.114	3 7 55.7	10.63	13 12.0
10	0 25 18.74	2.213	3 12 13.9	10.86	13 7.2
11	0 24 24.48	−2.306	−3 16 37.2	−11.05	13 2.4
12	0 23 28.03	2.394	3 21 4.6	11.20	12 57.5
13	0 22 29.54	2.476	3 25 35.0	11.31	12 52.6
14	0 21 29.17	2.552	3 30 7.3	11.37	12 47.7
15	0 20 27.08	2.621	3 34 40.7	11.39	12 42.7
16	0 19 23.43	−2.682	−3 39 14.0	−11.36	12 37.7
17	0 18 18.40	2.735	3 43 46.1	11.29	12 32.6
18	0 17 12.18	2.780	3 48 15.9	11.17	12 27.6
19	0 16 4.95	2.818	3 52 42.4	11.01	12 22.5
20	0 14 56.91	2.848	3 57 4.4	10.80	12 17.4
21	0 13 48.25	−2.870	−4 1 20.8	−10.55	12 12.4
22	0 12 39.15	2.884	4 5 30.6	10.26	12 7.3
23	0 11 29.80	2.891	4 9 32.9	9.92	12 2.2
24	0 10 20.40	2.891	4 13 26.7	9.55	11 57.1
25	0 9 11.14	2.883	4 17 11.1	9.14	11 52.0
26	0 8 2.18	−2.867	−4 20 45.2	− 8.70	11 47.0
27	0 6 53.71	2.842	4 24 8.1	8.22	11 41.9
28	0 5 45.90	2.809	4 27 19.3	7.71	11 36.8
29	0 4 38.91	2.770	4 30 18.0	7.18	11 31.7
30	0 3 32.90	2.725	4 33 3.6	6.63	11 26.7
31	0 2 28.03	−2.675	−4 35 35.5	− 6.05	11 21.7
32	0 1 24.45	−2.619	−4 37 53.2	− 5.44	11 16.7

Day of the Month.	3d.	8th.	13th.	18th.	23d.	28th.
	″	″	″	″	″	″
Semidiameter .	12.45	12.73	12.91	12.98	12.93	12.76
Hor. Parallax .	21.68	22.16	22.48	22.61	22.53	22.23

OCTOBER.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	0 2 28.03	−2.675	−4 35 35.5	− 6.05	11 21.7
2	0 1 24.45	2.619	4 37 53.2	5.44	11 16.7
3	0 0 22.30	2.557	4 39 56.2	4.81	11 11.7
4	23 59 21.73	2.489	4 41 44.0	4.15	11 6.8
5	23 58 22.88	2.415	4 43 16.1	3.48	11 1.9
6	23 57 25.89	−2.335	−4 44 32.0	− 2.80	10 57.1
7	23 56 30.89	2.249	4 45 31.4	2.11	10 52.3
8	23 55 38.02	2.156	4 46 13.8	1.41	10 47.5
9	23 54 47.40	2.057	4 46 39.0	− 0.70	10 42.7
10	23 53 59.14	1.955	4 46 46.5	+ 0.02	10 38.0
11	23 53 13.34	−1.851	−4 46 36.3	+ 0.76	10 33.4
12	23 52 30.10	1.744	4 46 8.1	1.52	10 28.8
13	23 51 49.52	1.634	4 45 21.7	2.31	10 24.2
14	23 51 11.67	1.520	4 44 17.0	3.09	10 19.7
15	23 50 36.62	1.403	4 42 53.9	3.87	10 15.2
16	23 50 4.42	−1.283	−4 41 12.4	+ 4.64	10 10.8
17	23 49 35.13	1.160	4 39 12.4	5.39	10 6.4
18	23 49 8.79	1.035	4 36 54.1	6.14	10 2.0
19	23 48 45.44	0.910	4 34 17.5	6.89	9 57.7
20	23 48 25.12	0.784	4 31 22.8	7.64	9 53.5
21	23 48 7.83	−0.658	−4 28 10.0	+ 8.38	9 49.3
22	23 47 53.58	0.531	4 24 39.5	9.12	9 45.1
23	23 47 42.37	0.404	4 20 51.4	9.86	9 41.0
24	23 47 34.19	0.278	4 16 46.1	10.58	9 37.0
25	23 47 29.03	0.153	4 12 23.6	11.29	9 33.0
26	23 47 26.87	−0.029	−4 7 44.5	+11.98	9 29.1
27	23 47 27.68	+0.094	4 2 49.1	12.65	9 25.3
28	23 47 31.42	0.216	3 57 37.8	13.30	9 21.4
29	23 47 38.07	0.337	3 52 10.8	13.94	9 17.5
30	23 47 47.59	0.457	3 46 28.4	14.57	9 13.7
31	23 47 59.94	+0.575	−3 40 31.1	+15.19	9 10.0
32	23 48 15.10	+0.691	−3 34 19.2	+15.80	9 6.3

Day of the Month.	3d.	8th.	13th.	18th.	23d.	28th.
	″	″	″	″	″	″
Semidiameter .	12.47	12.08	11.62	11.12	10.59	10.04
Hor. Parallax .	21.72	21.05	20.25	19.36	18.42	17.49

NOTE.—The sign + indicates north declinations; the sign − indicates south declinations.

GREENWICH MEAN TIME.

NOVEMBER.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	23 48 15.10	+0.691	−3 34 19.2	+15.80	9 6.3
2	23 48 33.04	0.805	3 27 52.9	16.39	9 2.7
3	23 48 53.72	0.918	3 21 12.6	16.97	8 59.2
4	23 49 17.10	1.030	3 14 18.6	17.54	8 55.6
5	23 49 43.14	1.140	3 7 11.0	18.10	8 52.1
6	23 50 11.82	+1.249	−2 59 50.1	+18.65	8 48.7
7	23 50 43.11	1.357	2 52 16.2	19.18	8 45.3
8	23 51 16.97	1.464	2 44 29.6	19.70	8 42.0
9	23 51 53.35	1.569	2 36 30.5	20.21	8 38.7
10	23 52 32.21	1.672	2 28 19.1	20.71	8 35.4
11	23 53 13.51	+1.772	−2 19 55.8	+21.21	8 32.1
12	23 53 57.21	1.870	2 11 20.8	21.70	8 28.9
13	23 54 43.27	1.966	2 2 34.4	22.18	8 25.8
14	23 55 31.64	2.061	1 53 36.7	22.65	8 22.7
15	23 56 22.28	2.155	1 44 28.1	23.10	8 19.6
16	23 57 15.15	+2.247	−1 35 8.9	+23.53	8 16.5
17	23 58 10.20	2.338	1 25 39.4	23.95	8 13.5
18	23 59 7.37	2.428	1 15 59.7	24.36	8 10.5
19	0 0 6.63	2.515	1 6 10.1	24.76	8 7.6
20	0 1 7.92	2.599	0 56 11.1	25.15	8 4.7
21	0 2 11.19	+2.679	−0 46 2.8	+25.53	8 1.8
22	0 3 16.39	2.756	0 35 45.5	25.90	7 59.0
23	0 4 23.47	2.832	0 25 19.6	26.26	7 56.2
24	0 5 32.37	2.907	0 14 45.5	26.60	7 53.4
25	0 6 43.04	2.980	−0 4 3.4	26.93	7 50.6
26	0 7 55.44	+3.051	+0 6 46.6	+27.24	7 47.9
27	0 9 9.53	3.121	0 17 44.0	27.54	7 45.2
28	0 10 25.26	3.189	0 28 48.4	27.83	7 42.6
29	0 11 42.60	3.256	0 39 59.8	28.11	7 40.0
30	0 13 1.51	3.321	0 51 17.9	28.38	7 37.4
31	0 14 21.95	+3.384	+1 2 42.4	+28.65	7 34.8
32	0 15 43.89	+3.445	+1 14 13.2	+28.91	7 32.2

Day of the Month.	2d.	7th.	12th.	17th.	22d.	27th.
	″	″	″	″	″	″
Semidiameter . .	9.51	8.99	8.50	8.03	7.60	7.19
Hor. Parallax . .	16.57	15.67	14.81	13.99	13.23	12.51

DECEMBER.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	0 14 21.95	+3.384	+1 2 42.4	+28.65	7 34.8
2	0 15 43.89	3.445	1 14 13.2	28.91	7 32.2
3	0 17 7.30	3.505	1 25 50.1	29.16	7 29.7
4	0 18 32.15	3.564	1 37 32.9	29.40	7 27.2
5	0 19 58.41	3.622	1 49 21.4	29.63	7 24.7
6	0 21 26.06	+3.679	+2 1 15.4	+29.86	7 22.2
7	0 22 55.07	3.736	2 13 14.8	30.08	7 19.7
8	0 24 25.41	3.792	2 25 19.3	30.29	7 17.3
9	0 25 57.05	3.847	2 37 28.8	30.50	7 14.9
10	0 27 29.97	3.900	2 49 43.2	30.70	7 12.5
11	0 29 4.14	+3.951	+3 2 2.2	+30.89	7 10.1
12	0 30 39.54	4.000	3 14 25.7	31.07	7 7.8
13	0 32 16.15	4.049	3 26 53.5	31.25	7 5.5
14	0 33 53.93	4.097	3 39 25.4	31.42	7 3.2
15	0 35 32.87	4.145	3 52 1.3	31.58	7 0.9
16	0 37 12.93	+4.192	+4 4 40.9	+31.73	6 58.6
17	0 38 54.10	4.238	4 17 24.1	31.87	6 56.4
18	0 40 36.35	4.283	4 30 10.7	32.01	6 54.2
19	0 42 19.64	4.327	4 43 0.4	32.14	6 52.0
20	0 44 3.95	4.369	4 55 53.0	32.26	6 49.8
21	0 45 49.27	+4.410	+5 8 48.4	+32.37	6 47.6
22	0 47 35.56	4.448	5 21 46.3	32.46	6 45.4
23	0 49 22.79	4.486	5 34 46.5	32.55	6 43.3
24	0 51 10.95	4.524	5 47 48.7	32.63	6 41.1
25	0 53 0.01	4.561	6 0 52.8	32.70	6 39.0
26	0 54 49.95	+4.598	+6 13 58.6	+32.77	6 36.9
27	0 56 40.76	4.635	6 27 6.0	32.84	6 34.8
28	0 58 32.42	4.670	6 40 14.7	32.89	6 32.8
29	1 0 24.91	4.705	6 53 24.6	32.93	6 30.7
30	1 2 18.23	4.739	7 6 35.4	32.97	6 28.7
31	1 4 12.36	+4.772	+7 19 47.0	+33.00	6 26.6
32	1 6 7.28	+4.805	+7 32 59.5	+33.03	6 24.6

Day of the Month.	2d.	7th.	12th.	17th.	22d.	27th.	32d.
	″	″	″	″	″	″	″
Semidiameter .	6.81	6.45	6.12	5.82	5.54	5.29	5.05
Hor. Parallax .	11.85	11.24	10.67	10.14	9.65	9.21	8.79

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing or south declinations are decreasing. The sign — indicates that north declinations are decreasing or south declinations increasing.

GREENWICH MEAN TIME.

JANUARY.

Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″	h m
1	11 4 49.07	−0.039	+7 11 49.9	+1.00	16 20.2
2	11 4 47.78	0.069	7 12 16.0	1.18	16 16.2
3	11 4 45.77	0.099	7 12 46.5	1.37	16 12.2
4	11 4 43.05	0.129	7 13 21.5	1.56	16 8.2
5	11 4 39.61	0.158	7 14 0.9	1.74	16 4.2
6	11 4 35.45	−0.188	+7 14 44.8	+1.92	16 0.2
7	11 4 30.57	0.218	7 15 33.1	2.11	15 56.2
8	11 4 24.98	0.248	7 16 25.9	2.29	15 52.2
9	11 4 18.67	0.278	7 17 23.0	2.47	15 48.2
10	11 4 11.65	0.307	7 18 24.4	2.65	15 44.1
11	11 4 3.92	−0.337	+7 19 30.2	+2.83	15 40.0
12	11 3 55.48	0.367	7 20 40.3	3.01	15 35.9
13	11 3 46.34	0.396	7 21 54.6	3.19	15 31.8
14	11 3 36.50	0.425	7 23 13.1	3.37	15 27.7
15	11 3 25.95	0.454	7 24 35.9	3.54	15 23.6
16	11 3 14.71	−0.483	+7 26 2.9	+3.71	15 19.5
17	11 3 2.79	0.511	7 27 33.9	3.88	15 15.4
18	11 2 50.20	0.539	7 29 9.0	4.05	15 11.2
19	11 2 36.93	0.567	7 30 48.2	4.22	15 7.1
20	11 2 22.98	0.595	7 32 31.4	4.38	15 2.9
21	11 2 8.38	−0.622	+7 34 18.4	+4.54	14 58.7
22	11 1 53.13	0.649	7 36 9.2	4.70	14 54.5
23	11 1 37.23	0.676	7 38 3.9	4.86	14 50.3
24	11 1 20.69	0.702	7 40 2.3	5.01	14 46.1
25	11 1 3.53	0.728	7 42 4.3	5.16	14 41.9
26	11 0 45.76	−0.753	+7 44 9.8	+5.30	14 37.6
27	11 0 27.38	0.778	7 46 18.8	5.44	14 33.4
28	11 0 8.42	0.802	7 48 31.1	5.58	14 29.2
29	10 59 48.90	0.825	7 50 46.6	5.72	14 24.9
30	10 59 28.82	0.848	7 53 5.4	5.85	14 20.6
31	10 59 8.18	−0.870	+7 55 27.4	+5.98	14 16.3
32	10 58 47.00	−0.892	+7 57 52.4	+6.10	14 12.0

Day of the Month.	3d.	11th.	19th.	27th.
	″	″	″	″
Semidiameter	19.34	19.78	20.19	20.56
Horizontal Parallax . .	1.81	1.85	1.89	1.92

FEBRUARY.

Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″	h m
1	10 58 47.00	−0.892	+7 57 52.4	+6.10	14 12.0
2	10 58 25.29	0.914	8 0 20.2	6.22	14 7.7
3	10 58 3.07	0.935	8 2 50.7	6.33	14 3.4
4	10 57 40.37	0.956	8 5 24.0	6.44	13 59.1
5	10 57 17.19	0.975	8 7 59.9	6.54	13 54.8
6	10 56 53.53	−0.994	+8 10 38.1	+6.64	13 50.5
7	10 56 29.42	1.013	8 13 18.7	6.74	13 46.1
8	10 56 4.88	1.031	8 16 1.7	6.83	13 41.8
9	10 55 39.91	1.049	8 18 46.9	6.92	13 37.5
10	10 55 14.53	1.066	8 21 34.0	7.00	13 33.1
11	10 54 48.76	−1.082	+8 24 23.1	+7.08	13 28.7
12	10 54 22.63	1.097	8 27 14.2	7.15	13 24.4
13	10 53 56.15	1.111	8 30 7.1	7.22	13 20.0
14	10 53 29.34	1.124	8 33 1.3	7.29	13 15.6
15	10 53 2.20	1.136	8 35 56.9	7.35	13 11.2
16	10 52 34.75	−1.148	+8 38 53.9	+7.40	13 6.8
17	10 52 7.02	1.159	8 41 52.2	7.45	13 2.4
18	10 51 39.03	1.170	8 44 51.5	7.50	12 58.0
19	10 51 10.80	1.181	8 47 51.7	7.54	12 53.6
20	10 50 42.36	1.191	8 50 52.8	7.57	12 49.2
21	10 50 13.73	−1.199	+8 53 54.7	+7.59	12 44.8
22	10 49 44.93	1.206	8 56 56.9	7.61	12 40.4
23	10 49 15.98	1.211	8 59 59.4	7.62	12 36.0
24	10 48 46.90	1.214	9 3 2.3	7.63	12 31.6
25	10 48 17.71	1.217	9 6 5.4	7.63	12 27.2
26	10 47 48.44	−1.220	+9 9 8.3	+7.62	12 22.8
27	10 47 19.11	1.222	9 12 10.9	7.61	12 18.4
28	10 46 49.73	1.224	9 15 13.3	7.59	12 14.0
29	10 46 20.34	1.225	9 18 15.3	7.57	12 9.6
30	10 45 50.95	1.225	9 21 16.6	7.54	12 5.1
31	10 45 21.58	−1.223	+9 24 17.2	+7.51	12 0.7
32	10 44 52.26	−1.221	+9 27 17.1	+7.48	11 56.2

Day of the Month.	4th.	12th.	20th.	28th.
	″	″	″	″
Semidiameter	20.86	21.10	21.25	21.30
Horizontal Parallax . .	1.95	1.97	1.99	1.99

NOTE.—The sign + indicates north declinations; the sign — indicates south declinations.

GREENWICH MEAN TIME.

	MARCH.						APRIL.				
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	*Noon.*	*Noon.*	*Noon.*			*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
1	10 46 20.34	− 1.225	+ 9 18 15.3	+ 7.57	12 9.6	1	10 32 48.13	− 0.836	+ 10 38 0.2	+ 4.62	9 54.2
2	10 45 50.95	1.225	9 21 16.6	7.54	12 5.1	2	10 32 28.32	0.813	10 39 49.4	4.47	9 50.0
3	10 45 21.58	1.223	9 24 17.2	7.51	12 0.7	3	10 32 9.09	0.789	10 41 34.9	4.32	9 45.8
4	10 44 52.26	1.221	9 27 17.1	7.48	11 56.2	4	10 31 50.44	0.765	10 43 16.7	4.16	9 41.5
5	10 44 23.00	1.218	9 30 16.0	7.44	11 51.8	5	10 31 32.38	0.740	10 44 54.8	4.00	9 37.3
6	10 43 53.82	− 1.214	+ 9 33 13.8	+ 7.40	11 47.4	6	10 31 14.91	− 0.715	+ 10 46 29.0	+ 3.85	9 33.1
7	10 43 24.74	1.209	9 36 10.4	7.34	11 43.0	7	10 30 58.04	0.690	10 47 59.4	3.70	9 28.9
8	10 42 55.77	1.203	9 39 5.8	7.28	11 38.6	8	10 30 41.78	0.664	10 49 26.0	3.54	9 24.7
9	10 42 26.95	1.196	9 41 59.8	7.21	11 34.2	9	10 30 26.13	0.638	10 50 48.8	3.38	9 20.5
10	10 41 58.30	1.189	9 44 52.2	7.14	11 29.8	10	10 30 11.11	0.612	10 52 7.7	3.22	9 16.3
11	10 41 29.84	− 1.181	+ 9 47 42.8	+ 7.07	11 25.4	11	10 29 56.73	− 0.585	+ 10 53 22.6	+ 3.05	9 12.1
12	10 41 1.59	1.172	9 50 31.6	6.99	11 21.0	12	10 29 42.99	0.558	10 54 33.5	2.88	9 7.9
13	10 40 33.56	1.162	9 53 18.7	6.91	11 16.6	13	10 29 29.90	0.531	10 55 40.4	2.71	9 3.8
14	10 40 5.77	1.152	9 56 3.8	6.83	11 12.2	14	10 29 17.47	0.504	10 56 43.2	2.54	8 59.6
15	10 39 38.24	1.141	9 58 46.8	6.74	11 7.8	15	10 29 5.70	0.476	10 57 42.0	2.37	8 55.5
16	10 39 10.99	− 1.129	+ 10 1 27.5	+ 6.65	11 3.5	16	10 28 54.60	− 0.448	+ 10 58 36.8	+ 2.20	8 51.4
17	10 38 44.03	1.116	10 4 5.9	6.55	10 59.1	17	10 28 44.16	0.420	10 59 27.6	2.03	8 47.3
18	10 38 17.40	1.102	10 6 41.9	6.44	10 54.7	18	10 28 34.39	0.392	11 0 14.3	1.86	8 43.2
19	10 37 51.10	1.087	10 9 15.4	6.33	10 50.3	19	10 28 25.30	0.364	11 0 56.7	1.69	8 39.1
20	10 37 25.16	1.072	10 11 46.3	6.22	10 46.0	20	10 28 16.90	0.336	11 1 35.0	1.51	8 35.0
21	10 36 59.60	− 1.056	+ 10 14 14.5	+ 6.11	10 41.6	21	10 28 9.19	− 0.307	+ 11 2 9.1	+ 1.34	8 31.0
22	10 36 34.44	1.039	10 16 39.9	5.99	10 37.3	22	10 28 2.20	0.278	11 2 39.0	1.17	8 26.9
23	10 36 9.69	1.021	10 19 2.4	5.87	10 32.9	23	10 27 55.91	0.249	11 3 4.7	1.00	8 22.9
24	10 35 45.37	1.003	10 21 21.9	5.74	10 28.6	24	10 27 50.32	0.219	11 3 26.3	0.82	8 18.9
25	10 35 21.51	0.984	10 23 38.3	5.61	10 24.3	25	10 27 45.44	0.189	11 3 43.7	0.64	8 14.9
26	10 34 58.11	− 0.965	+ 10 25 51.5	+ 5.48	10 20.0	26	10 27 41.24	− 0.159	+ 11 3 57.0	+ 0.47	8 10.9
27	10 34 35.18	0.945	10 28 1.4	5.34	10 15.7	27	10 27 37.75	0.130	11 4 6.2	0.29	8 7.0
28	10 34 12.74	0.924	10 30 8.0	5.20	10 11.4	28	10 27 34.96	0.101	11 4 11.2	+ 0.12	8 3.0
29	10 33 50.80	0.903	10 32 11.3	5.06	10 7.1	29	10 27 32.88	0.072	11 4 12.0	− 0.05	7 59.0
30	10 33 29.38	0.881	10 34 11.1	4.92	10 2.8	30	10 27 31.50	0.043	11 4 8.7	0.22	7 55.1
31	10 33 8.49	− 0.859	+ 10 36 7.4	+ 4.77	9 58.5	31	10 27 30.82	− 0.014	+ 11 4 1.3	− 0.39	7 51.2
32	10 32 48.13	− 0.836	+ 10 38 0.2	+ 4.62	9 54.2	32	10 27 30.83	+ 0.015	+ 11 3 49.8	− 0.56	7 47.3

Day of the Month.	8th.	16th.	24th.	Day of the Month.	1st.	9th.	17th.	25th.
	″	″	″		″	″	″	″
Semidiameter	21.26	21.11	20.90	Semidiameter	20.61	20.25	19.85	19.42
Horizontal Parallax	1.99	1.98	1.95	Horizontal Parallax . .	1.92	1.89	1.86	1.82

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing or south declinations are decreasing. The sign — indicates that north declinations are decreasing or south declinations increasing.

GREENWICH MEAN TIME.

MAY.						JUNE.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon	*Noon.*	*Noon.*	*Noon.*			*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
1	10 27 30.82	− 0.014	+ 11 4 1.3	− 0.39	7 51.2	1	10 32 40.54	+ 0.819	+ 10 28 0.5	− 5.26	5 54.5
2	10 27 30.83	+ 0.015	11 3 49.8	0.56	7 47.3	2	10 33 0.46	0.842	10 25 52.7	5.40	5 50.9
3	10 27 31.53	0.044	11 3 34.3	0.73	7 43.3	3	10 33 20.94	0.865	10 23 41.7	5.53	5 47.3
4	10 27 32.92	0.073	11 3 14.6	0.90	7 39.4	4	10 33 41.97	0.888	10 21 27.4	5.66	5 43.7
5	10 27 35.00	0.101	11 2 50.9	1.07	7 35.5	5	10 34 3.55	0.910	10 19 9.8	5.80	5 40.1
6	10 27 37.77	+ 0.130	+ 11 2 23.2	− 1.24	7 31.6	6	10 34 25.66	+ 0.932	+ 10 16 49.1	− 5.93	5 36.6
7	10 27 41.23	0.159	11 1 51.6	1.41	7 27.7	7	10 34 48.30	0.954	10 14 25.2	6.06	5 33.0
8	10 27 45.36	0.187	11 1 15.9	1.58	7 23.8	8	10 35 11.48	0.976	10 11 58.2	6.19	5 29.5
9	10 27 50.17	0.215	11 0 36.3	1.74	7 19.9	9	10 35 35.19	0.998	10 9 28.0	6.32	5 25.9
10	10 27 55.66	0.243	10 59 52.8	1.90	7 16.1	10	10 35 59.40	1.019	10 6 54.8	6.45	5 22.4
11	10 28 1.83	+ 0.271	+ 10 59 5.3	− 2.06	7 12.3	11	10 36 24.11	+ 1.040	+ 10 4 18.5	− 6.58	5 18.9
12	10 28 8.68	0.299	10 58 13.8	2.22	7 8.5	12	10 36 49.33	1.061	10 1 39.2	6.71	5 15.4
13	10 28 16.20	0.327	10 57 18.5	2.38	7 4.7	13	10 37 15.06	1.082	9 58 56.8	6.83	5 11.9
14	10 28 24.38	0.355	10 56 19.4	2.54	7 0.9	14	10 37 41.27	1.102	9 56 11.5	6.95	5 8.4
15	10 28 33.22	0.382	10 55 16.5	2.70	6 57.2	15	10 38 7.97	1.122	9 53 23.3	7.07	5 4.9
16	10 28 42.73	+ 0.410	+ 10 54 9.8	− 2.86	6 53.4	16	10 38 35.16	+ 1.142	+ 9 50 32.1	− 7.19	5 1.4
17	10 28 52.89	0.437	10 52 59.2	3.02	6 49.6	17	10 39 2.83	1.162	9 47 38.0	7.31	4 57.9
18	10 29 3.69	0.464	10 51 44.8	3.18	6 45.8	18	10 39 30.96	1.182	9 44 41.1	7.43	4 54.5
19	10 29 15.14	0.491	10 50 26.5	3.34	6 42.1	19	10 39 59.56	1.201	9 41 41.3	7.55	4 51.0
20	10 29 27.25	0.518	10 49 4.4	3.50	6 38.4	20	10 40 28.62	1.219	9 38 38.7	7.67	4 47.6
21	10 29 39.99	+ 0.544	+ 10 47 38.7	− 3.65	6 34.7	21	10 40 58.12	+ 1.238	+ 9 35 33.3	− 7.78	4 44.1
22	10 29 53.36	0.570	10 46 9.4	3.80	6 31.0	22	10 41 28.05	1.256	9 32 25.2	7.89	4 40.7
23	10 30 7.36	0.596	10 44 36.5	3.95	6 27.3	23	10 41 58.42	1.274	9 29 14.5	8.00	4 37.3
24	10 30 21.98	0.622	10 43 0.0	4.10	6 23.6	24	10 42 29.22	1.292	9 26 1.1	8.11	4 33.9
25	10 30 37.21	0.647	10 41 19.8	4.25	6 19.9	25	10 43 0.45	1.309	9 22 45.0	8.22	4 30.4
26	10 30 53.05	+ 0.672	+ 10 39 36.1	− 4.40	6 16.2	26	10 43 32.09	+ 1.326	+ 9 19 26.4	− 8.33	4 27.0
27	10 31 9.50	0.697	10 37 48.8	4.55	6 12.6	27	10 44 4.14	1.343	9 16 5.3	8.44	4 23.6
28	10 31 26.54	0.722	10 35 58.0	4.70	6 8.9	28	10 44 36.60	1.360	9 12 41.6	8.54	4 20.2
29	10 31 44.17	0.747	10 34 3.8	4.84	6 5.3	29	10 45 9.45	1.377	9 9 15.4	8.64	4 16.8
30	10 32 2.39	0.771	10 32 6.1	4.98	6 1.7	30	10 45 42.68	1.393	9 5 46.8	8.74	4 13.4
31	10 32 21.18	+ 0.795	+ 10 30 5.0	− 5.12	5 58.1	31	10 46 16.29	+ 1.409	+ 9 2 15.8	− 8.84	4 10.0
32	10 32 40.54	+ 0.819	+ 10 28 0.5	− 5.26	5 54.5	32	10 46 50.27	+ 1.424	+ 8 58 42.3	− 8.94	4 6.7

Day of the Month.	3d.	11th.	19th.	27th.	Day of the Month.	4th.	12th.	20th.	28th.
	″	″	″	″		″	″	″	″
Semidiameter	18.98	18.54	18.09	17.66	Semidiameter	17.26	16.87	16.51	16.18
Horizontal Parallax . . .	1.77	1.73	1.69	1.65	Horizontal Parallax . . .	1.61	1.58	1.54	1.51

Note.—The sign + indicates north declinations; the sign — indicates south declinations.

GREENWICH MEAN TIME.

JULY.						AUGUST.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
1	10 46 16.29	+ 1.409	+ 9 2 15.8	− 8.84	4 10.0	1	11 6 17.63	+ 1.785	+ 6 55 52.1	− 11.35	2 28.2
2	10 46 50.27	1.424	8 58 42.3	8.94	4 6.7	2	11 7 0.55	1.793	6 51 19.2	11.41	2 25.0
3	10 47 24.63	1.439	8 55 6.4	9.04	4 3.3	3	11 7 43.68	1.801	6 46 44.8	11.47	2 21.7
4	10 47 59.35	1.454	8 51 28.3	9.13	4 0.0	4	11 8 27.01	1.809	6 42 9.0	11.53	2 18.5
5	10 48 34.42	1.469	8 47 47.9	9.23	3 56.6	5	11 9 10.53	1.817	6 37 31.9	11.59	2 15.3
6	10 49 9.85	+ 1.484	+ 8 44 5.3	− 9.33	3 53.3	6	11 9 54.25	+ 1.825	+ 6 32 53.5	− 11.64	2 12.1
7	10 49 45.63	1.498	8 40 20.3	9.42	3 49.9	7	11 10 38.16	1.833	6 28 13.8	11.69	2 8.9
8	10 50 21.75	1.512	8 36 33.2	9.51	3 46.6	8	11 11 22.25	1.841	6 23 32.7	11.74	2 5.7
9	10 50 58.21	1.526	8 32 43.9	9.60	3 43.3	9	11 12 6.52	1.848	6 18 50.4	11.79	2 2.5
10	10 51 35.01	1.540	8 28 52.5	9.69	3 40.0	10	11 12 50.96	1.855	6 14 6.8	11.84	1 59.3
11	10 52 12.13	+ 1.554	+ 8 24 58.8	− 9.78	3 36.7	11	11 13 35.58	+ 1.862	+ 6 9 22.0	− 11.89	1 56.1
12	10 52 49.57	1.567	8 21 3.1	9.87	3 33.4	12	11 14 20.36	1.869	6 4 36.0	11.94	1 52.9
13	10 53 27.33	1.580	8 17 5.3	9.96	3 30.1	13	11 15 5.30	1.876	5 59 48.8	11.99	1 49.7
14	10 54 5.42	1.593	8 13 5.4	10.04	3 26.8	14	11 15 50.40	1.882	5 55 0.5	12.04	1 46.5
15	10 54 43.81	1.606	8 9 3.5	10.12	3 23.5	15	11 16 35.67	1.888	5 50 11.1	12.09	1 43.4
16	10 55 22.49	+ 1.618	+ 8 4 59.6	− 10.20	3 20.2	16	11 17 21.07	+ 1.894	+ 5 45 20.6	− 12.13	1 40.2
17	10 56 1.46	1.630	8 0 53.7	10.28	3 16.9	17	11 18 6.61	1.900	5 40 29.1	12.17	1 37.0
18	10 56 40.73	1.642	7 56 45.9	10.36	3 13.6	18	11 18 52.29	1.906	5 35 36.6	12.21	1 33.8
19	10 57 20.28	1.654	7 52 36.2	10.44	3 10.3	19	11 19 38.10	1.911	5 30 43.2	12.25	1 30.7
20	10 58 0.11	1.665	7 48 24.6	10.52	3 7.0	20	11 20 24.03	1.916	5 25 48.8	12.29	1 27.5
21	10 58 40.21	+ 1.676	+ 7 44 11.2	− 10.60	3 3.7	21	11 21 10.08	+ 1.921	+ 5 20 53.5	− 12.33	1 24.3
22	10 59 20.58	1.687	7 39 56.0	10.67	3 0.5	22	11 21 56.25	1.926	5 15 57.4	12.36	1 21.1
23	11 0 1.22	1.698	7 35 39.0	10.74	2 57.2	23	11 22 42.54	1.931	5 11 0.4	12.39	1 18.0
24	11 0 42.10	1.708	7 31 20.3	10.81	2 54.0	24	11 23 28.93	1.935	5 6 2.6	12.42	1 14.8
25	11 1 23.23	1.718	7 26 59.9	10.88	2 50.7	25	11 24 15.42	1.939	5 1 4.1	12.45	1 11.6
26	11 2 4.60	+ 1.728	+ 7 22 37.8	− 10.95	2 47.5	26	11 25 2.01	+ 1.943	+ 4 56 4.9	− 12.48	1 8.4
27	11 2 46.21	1.738	7 18 14.1	11.02	2 44.3	27	11 25 48.70	1.947	4 51 5.0	12.51	1 5.3
28	11 3 28.05	1.748	7 13 48.8	11.09	2 41.0	28	11 26 35.49	1.951	4 46 4.4	12.54	1 2.1
29	11 4 10.11	1.758	7 9 21.9	11.15	2 37.8	29	11 27 22.36	1.955	4 41 3.2	12.57	0 59.0
30	11 4 52.40	1.767	7 4 53.4	11.22	2 34.6	30	11 28 9.30	1.958	4 36 1.3	12.60	0 55.8
31	11 5 34.91	+ 1.776	+ 7 0 23.5	− 11.29	2 31.4	31	11 28 56.32	+ 1.961	+ 4 30 58.8	− 12.62	0 52.7
32	11 6 17.63	+ 1.785	+ 6 55 52.1	− 11.35	2 28.2	32	11 29 43.42	+ 1.964	+ 4 25 55.8	− 12.64	0 49.5

Day of the Month.	6th.	14th.	22d.	30th.	Day of the Month.	7th.	15th.	23d.	31st.
	″	″	″	″		″	″	″	″
Semidiameter	15.89	15.62	15.39	15.19	Semidiameter	15.02	14.87	14.76	14.68
Horizontal Parallax . .	1.49	1.46	1.44	1.42	Horizontal Parallax . .	1.40	1.39	1.38	1.37

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing or south declinations are decreasing. The sign — indicates that north declinations are decreasing or south declinations increasing.

GREENWICH MEAN TIME.

SEPTEMBER.

Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ′ ″	″	h m
1	11 29 43.42	+ 1.964	+ 4 25 55.8	− 12.64	0 49.5
2	11 30 30.59	1.967	4 20 52.3	12.66	0 46.4
3	11 31 17.83	1.970	4 15 48.3	12.68	0 43.2
4	11 32 5.14	1.973	4 10 43.8	12.70	0 40.1
5	11 32 52.51	1.976	4 5 38.9	12.72	0 36.9
6	11 33 39.93	+ 1.978	+ 4 0 33.6	− 12.74	0 33.8
7	11 34 27.40	1.980	3 55 27.8	12.75	0 30.7
8	11 35 14.92	1.982	3 50 21.6	12.77	0 27.6
9	11 36 2.49	1.984	3 45 15.1	12.78	0 24.5
10	11 36 50.10	1.985	3 40 8.4	12.79	0 21.3
11	11 37 37.75	+ 1.986	+ 3 35 1.4	− 12.80	0 18.2
12	11 38 25.43	1.987	3 29 54.1	12.81	0 15.0
13	11 39 13.15	1.988	3 24 46.6	12.81	0 11.9
14	11 40 0.89	1.989	3 19 39.0	12.82	0 8.7
15	11 40 48.66	1.990	3 14 31.3	12.82	0 5.6
16	11 41 36.44	+ 1.990	+ 3 9 23.5	− 12.83	0 2.4 23 59.3
17	11 42 24.22	1.991	3 4 15.6	12.83	23 56.2
18	11 43 12.00	1.991	2 59 7.7	12.83	23 53.0
19	11 43 59.77	1.990	2 53 59.8	12.83	23 49.9
20	11 44 47.53	1.989	2 48 52.0	12.82	23 46.8
21	11 45 35.26	+ 1.988	+ 2 43 44.3	− 12.82	23 43.6
22	11 46 22.97	1.987	2 38 36.7	12.81	23 40.5
23	11 47 10.66	1.986	2 33 29.3	12.80	23 37.3
24	11 47 58.33	1.985	2 28 22.1	12.79	23 34.2
25	11 48 45.97	1.984	2 23 15.1	12.78	23 31.0
26	11 49 33.59	+ 1.983	+ 2 18 8.4	− 12.77	23 27.9
27	11 50 21.18	1.982	2 13 2.0	12.76	23 24.7
28	11 51 8.74	1.980	2 7 55.8	12.75	23 21.6
29	11 51 56.26	1.978	2 2 50.0	12.74	23 18.5
30	11 52 43.73	1.976	1 57 44.6	12.72	23 15.3
31	11 53 31.14	+ 1.974	+ 1 52 39.7	− 12.70	23 12.2
32	11 54 18.49	+ 1.972	+ 1 47 35.2	− 12.68	23 9.1

Day of the Month.	8th.	16th.	24th.
	″	″	″
Semidiameter	14.63	14.60	14.61
Horizontal Parallax	1.37	1.37	1.37

OCTOBER.

Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ′ ″	″	h m
1	11 53 31.14	+ 1.974	+ 1 52 39.7	− 12.70	23 12.2
2	11 54 18.49	1.972	1 47 35.2	12.68	23 9.1
3	11 55 5.78	1.969	1 42 31.1	12.66	23 5.9
4	11 55 53.02	1.966	1 37 27.5	12.64	23 2.8
5	11 56 40.20	1.963	1 32 24.5	12.62	22 59.6
6	11 57 27.31	+ 1.960	+ 1 27 22.0	− 12.59	22 56.5
7	11 58 14.34	1.957	1 22 20.1	12.56	22 53.3
8	11 59 1.29	1.954	1 17 18.9	12.53	22 50.1
9	11 59 48.15	1.950	1 12 18.3	12.50	22 46.9
10	12 0 34.92	1.946	1 7 18.4	12.47	22 43.8
11	12 1 21.59	+ 1.942	+ 1 2 19.3	− 12.44	22 40.6
12	12 2 8.16	1.938	0 57 21.0	12.41	22 37.5
13	12 2 54.63	1.933	0 52 23.5	12.38	22 34.3
14	12 3 40.99	1.928	0 47 26.8	12.34	22 31.2
15	12 4 27.23	1.923	0 42 31.1	12.30	22 28.0
16	12 5 13.35	+ 1.918	+ 0 37 36.4	− 12.26	22 24.8
17	12 5 59.34	1.914	0 32 42.6	12.22	22 21.6
18	12 6 45.20	1.908	0 27 49.8	12.18	22 18.5
19	12 7 30.93	1.902	0 22 58.1	12.13	22 15.3
20	12 8 16.51	1.896	0 18 7.5	12.08	22 12.1
21	12 9 1.94	+ 1.890	+ 0 13 18.1	− 12.03	22 8.9
22	12 9 47.22	1.883	0 8 29.9	11.98	22 5.8
23	12 10 32.33	1.876	+ 0 3 42.9	11.93	22 2.6
24	12 11 17.28	1.869	− 0 1 2.8	11.88	21 59.4
25	12 12 2.07	1.862	0 5 47.3	11.83	21 56.2
26	12 12 46.70	+ 1.855	− 0 10 30.6	− 11.77	21 53.0
27	12 13 31.15	1.848	0 15 12.5	11.71	21 49.8
28	12 14 15.41	1.840	0 19 52.9	11.65	21 46.6
29	12 14 59.49	1.832	0 24 31.9	11.59	21 43.4
30	12 15 43.39	1.824	0 29 9.6	11.53	21 40.2
31	12 16 27.09	+ 1.816	− 0 33 45.8	− 11.47	21 37.0
32	12 17 10.59	+ 1.808	− 0 38 20.4	− 11.41	21 33.8

Day of the Month.	2d.	10th.	18th.	26th.
	″	″	″	″
Semidiameter	14.66	14.73	14.84	14.97
Horizontal Parallax . . .	1.37	1.38	1.39	1.40

Note.—The sign + indicates north declinations; the sign — indicates south declinations.

GREENWICH MEAN TIME.

NOVEMBER.						DECEMBER.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	*Noon.*	*Noon.*	*Noon.*			*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
1	12 17 10.59	+ 1.808	− 0 38 20.4	− 11.41	21 33.8	1	12 36 53.39	+ 1.439	− 2 40 32.8	− 8.71	19 55.3
2	12 17 53.88	1.800	0 42 53.4	11.34	21 30.5	2	12 37 27.73	1.423	2 44 0.5	8.60	19 51.9
3	12 18 36.97	1.791	0 47 24.8	11.27	21 27.3	3	12 38 1.67	1.406	2 47 25.4	8.48	19 48.6
4	12 19 19.84	1.782	0 51 54.6	11.20	21 24.1	4	12 38 35.20	1.389	2 50 47.5	8.36	19 45.2
5	12 20 2.48	1.773	0 56 22.8	11.13	21 20.9	5	12 39 8.33	1.372	2 54 6.8	8.24	19 41.8
6	12 20 44.89	+ 1.764	− 1 0 49.2	− 11.06	21 17.6	6	12 39 41.05	+ 1.355	− 2 57 23.1	− 8.12	19 38.4
7	12 21 27.07	1.754	1 5 13.9	10.99	21 14.4	7	12 40 13.36	1.337	3 0 36.4	8.00	19 35.0
8	12 22 9.02	1.744	1 9 36.8	10.92	21 11.1	8	12 40 45.25	1.319	3 3 46.8	7.87	19 31.6
9	12 22 50.73	1.733	1 13 57.8	10.84	21 7.9	9	12 41 16.69	1.301	3 6 54.2	7.74	19 28.2
10	12 23 32.19	1.722	1 18 17.0	10.76	21 4.6	10	12 41 47.68	1.282	3 9 58.5	7.61	19 24.8
11	12 24 13.40	+ 1.711	− 1 22 34.3	− 10.68	21 1.4	11	12 42 18.21	+ 1.263	− 3 12 59.6	− 7.48	19 21.4
12	12 24 54.33	1.700	1 26 49.6	10.60	20 58.1	12	12 42 48.29	1.244	3 15 57.5	7.35	19 17.9
13	12 25 34.98	1.688	1 31 2.9	10.52	20 54.9	13	12 43 17.91	1.224	3 18 52.3	7.22	19 14.5
14	12 26 15.35	1.676	1 35 14.1	10.43	20 51.6	14	12 43 47.05	1.204	3 21 43.8	7.08	19 11.0
15	12 26 55.45	1.664	1 39 23.3	10.34	20 48.4	15	12 44 15.70	1.184	3 24 32.0	6.94	19 7.5
16	12 27 35.25	+ 1.652	− 1 43 30.3	− 10.25	20 45.1	16	12 44 43.87	+ 1.164	− 3 27 16.9	− 6.80	19 4.0
17	12 28 14.75	1.639	1 47 35.1	10.16	20 41.8	17	12 45 11.55	1.143	3 29 58.4	6.66	19 0.5
18	12 28 53.95	1.626	1 51 37.7	10.07	20 38.5	18	12 45 38.72	1.122	3 32 36.4	6.52	18 57.0
19	12 29 32.84	1.613	1 55 38.1	9.97	20 35.2	19	12 46 5.38	1.101	3 35 11.0	6.38	18 53.5
20	12 30 11.42	1.600	1 59 36.2	9.87	20 31.9	20	12 46 31.53	1.079	3 37 42.2	6.23	18 50.0
21	12 30 49.68	+ 1.587	− 2 3 31.9	− 9.77	20 28.6	21	12 46 57.17	+ 1.057	− 3 40 10.0	− 6.08	18 46.5
22	12 31 27.61	1.573	2 7 25.2	9.67	20 25.3	22	12 47 22.28	1.035	3 42 34.1	5.93	18 43.0
23	12 32 5.21	1.559	2 11 16.1	9.57	20 22.0	23	12 47 46.85	1.013	3 44 54.6	5.78	18 39.5
24	12 32 42.47	1.545	2 15 4.5	9.47	20 18.7	24	12 48 10.89	0.990	3 47 11.6	5.63	18 35.9
25	12 33 19.38	1.531	2 18 50.4	9.37	20 15.4	25	12 48 34.39	0.967	3 49 25.0	5.48	18 32.4
26	12 33 55.94	+ 1.516	− 2 22 33.9	− 9.26	20 12.0	26	12 48 57.33	+ 0.944	− 3 51 34.7	− 5.33	18 28.8
27	12 34 32.16	1.501	2 26 14.9	9.15	20 8.7	27	12 49 19.71	0.921	3 53 40.7	5.18	18 25.3
28	12 35 8.03	1.486	2 29 53.3	9.04	20 5.3	28	12 49 41.54	0.897	3 55 43.0	5.02	18 21.7
29	12 35 43.53	1.471	2 33 29.1	8.93	20 2.0	29	12 50 2.81	0.873	3 57 41.5	4.86	18 18.1
30	12 36 18.65	1.455	2 37 2.3	8.82	19 58.6	30	12 50 23.51	0.849	3 59 36.2	4.70	18 14.5
31	12 36 53.39	+ 1.439	− 2 40 32.8	− 8.71	19 55.3	31	12 50 43.62	+ 0.825	− 4 1 27.1	− 4.54	18 10.9
32	12 37 27.73	+ 1.423	− 2 44 0.5	− 8.60	19 51.9	32	12 51 3.13	+ 0.801	− 4 3 14.2	− 4.38	18 7.3

Day of the Month.	3d.	11th.	19th.	27th.	Day of the Month.	5th.	13th.	21st.	29th.	37th.
	″	″	″	″		″	″	″	″	″
Semidiameter	15.14	15.34	15.58	15.84	Semidiameter . . .	16.14	16.48	16.85	17.24	17.65
Horizontal Parallax . . .	1.42	1.44	1.46	1.48	Horizontal Parallax .	1.51	1.54	1.57	1.61	1.65

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing or south declinations are decreasing. The sign — indicates that north declinations are decreasing or south declinations increasing.

GREENWICH MEAN TIME.

JANUARY.

Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ′ ″	″	h m
1	0 18 22.04	+0.402	−0 38 20.3	+3.25	5 35.5
2	0 18 31.88	0.417	0 37 1.1	3.35	5 31.7
3	0 18 42.08	0.433	0 35 39.6	3.44	5 28.0
4	0 18 52.65	0.448	0 34 15.8	3.54	5 24.2
5	0 19 3.58	0.463	0 32 49.8	3.64	5 20.4
6	0 19 14.87	+0.478	−0 31 21.6	+3.73	5 16.7
7	0 19 26.52	0.493	0 29 51.1	3.82	5 13.0
8	0 19 38.51	0.507	0 28 18.4	3.91	5 9.2
9	0 19 50.86	0.522	0 26 43.6	4.00	5 5.5
10	0 20 3.56	0.537	0 25 6.7	4.09	5 1.8
11	0 20 16.60	+0.551	−0 23 27.7	+4.18	4 58.1
12	0 20 29.98	0.565	0 21 45.5	4.27	4 54.4
13	0 20 43.70	0.579	0 20 3.3	4.35	4 50.7
14	0 20 57.75	0.593	0 18 18.1	4.43	4 47.0
15	0 21 12.14	0.607	0 16 30.9	4.51	4 43.3
16	0 21 26.85	+0.621	−0 14 41.7	+4.59	4 39.6
17	0 21 41.89	0.634	0 12 50.5	4.67	4 35.9
18	0 21 57.25	0.647	0 10 57.4	4.75	4 32.2
19	0 22 12.94	0.660	0 9 2.4	4.83	4 28.6
20	0 22 28.94	0.673	0 7 5.4	4.91	4 24.9
21	0 22 45.26	+0.686	−0 5 6.6	+4.99	4 21.2
22	0 23 1.89	0.699	0 3 6.0	5.07	4 17.6
23	0 23 18.82	0.712	−0 1 3.5	5.14	4 14.0
24	0 23 36.05	0.724	+0 1 0.8	5.21	4 10.3
25	0 23 53.57	0.736	0 3 6.8	5.28	4 6.6
26	0 24 11.39	+0.748	+0 5 14.5	+5.35	4 3.0
27	0 24 29.49	0.760	0 7 23.9	5.42	3 59.4
28	0 24 47.88	0.772	0 9 34.9	5.49	3 55.7
29	0 25 6.54	0.784	0 11 47.5	5.56	3 52.1
30	0 25 25.48	0.795	0 14 1.8	5.63	3 48.5
31	0 25 44.69	+0.806	+0 16 17.6	+5.69	3 44.9
32	0 26 4.17	+0.817	+0 18 34.9	+5.75	3 41.3

Day of the Month.	3d.	11th	19th.	27th.
	″	″	″	″
Semidiameter	8.20	8.09	8.00	7.91
Horizontal Parallax . .	0.92	0.91	0.90	0.89

FEBRUARY.

Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ′ ″	″	h m
1	0 26 4.17	+0.817	+0 18 34.9	+5.75	3 41.3
2	0 26 23.91	0.828	0 20 53.7	5.81	3 37.7
3	0 26 43.91	0.839	0 23 14.0	5.87	3 34.1
4	0 27 4.16	0.850	0 25 35.8	5.93	3 30.5
5	0 27 24.66	0.860	0 27 59.0	5.99	3 26.9
6	0 27 45.40	+0.870	+0 30 23.5	+6.05	3 23.3
7	0 28 6.38	0.880	0 32 49.3	6.10	3 19.7
8	0 28 27.61	0.890	0 35 16.5	6.16	3 16.2
9	0 28 49.07	0.900	0 37 45.1	6.21	3 12.6
10	0 29 10.76	0.909	0 40 14.9	6.26	3 9.0
11	0 29 32.68	+0.918	+0 42 45.9	+6.31	3 5.4
12	0 29 54.82	0.927	0 45 18.0	6.36	3 1.9
13	0 30 17.18	0.936	0 47 51.4	6.41	2 58.3
14	0 30 39.75	0.945	0 50 25.9	6.46	2 54.7
15	0 31 2.53	0.954	0 53 1.6	6.51	2 51.2
16	0 31 25.53	+0.963	+0 55 38.4	+6.56	2 47.7
17	0 31 48.73	0.971	0 58 16.3	6.60	2 44.1
18	0 32 12.12	0.979	1 0 55.2	6.64	2 40.5
19	0 32 35.70	0.987	1 3 35.1	6.68	2 37.0
20	0 32 59.48	0.995	1 6 16.1	6.72	2 33.5
21	0 33 23.45	+1.002	+1 8 58.0	+6.76	2 29.9
22	0 33 47.59	1.009	1 11 40.8	6.80	2 26.4
23	0 34 11.90	1.016	1 14 24.4	6.84	2 22.9
24	0 34 36.39	1.023	1 17 8.9	6.88	2 19.4
25	0 35 1.05	1.030	1 19 54.3	6.91	2 15.8
26	0 35 25.87	+1.037	+1 22 40.4	+6.94	2 12.3
27	0 35 50.84	1.044	1 25 27.2	6.97	2 8.8
28	0 36 15.96	1.050	1 28 14.8	7.00	2 5.3
29	0 36 41.23	1.056	1 31 3 1	7.03	2 1.8
30	0 37 6.64	1.062	1 33 52.0	7.05	1 58.3
31	0 37 32.19	+1.068	+1 36 41.6	+7.07	1 54.8
32	0 37 57.89	+1.074	+1 39 31.8	+7.10	1 51.3

Day of the Month.	4th.	12th.	20th.	28th.
	″	″	″	″
Semidiameter	7.82	7.74	7.67	7.62
Horizontal Parallax . .	0.88	0.87	0.86	0.86

NOTE.—The sign + indicates north declinations; the sign − indicates south declinations.

GREENWICH MEAN TIME.

MARCH.						APRIL.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	*Noon.*	*Noon.*	*Noon.*			*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
1	0 36 41.23	+ 1.056	+ 1 31 3.1	+ 7.03	2 1.8	1	0 50 36.00	+ 1.160	+ 3 1 9.8	+ 7.31	0 13.8
2	0 37 6.64	1.062	1 33 52.0	7.05	1 58.3	2	0 51 3.85	1.160	3 4 5.4	7.30	0 10.4
3	0 37 32.19	1.068	1 36 41.6	7.07	1 54.8	3	0 51 31.71	1.161	3 7 0.7	7.29	0 6.9
4	0 37 57.89	1.074	1 39 31.8	7.10	1 51.3	4	0 51 59.58	1.161	3 9 55.7	7.28	0 3.4 23 59.9
5	0 38 23.72	1.079	1 42 22.6	7.13	1 47.8	5	0 52 27.45	1.161	3 12 50.5	7.27	23 56.5
6	0 38 49.67	+ 1.084	+ 1 45 13.9	+ 7.15	1 44.3	6	0 52 55.32	+ 1.160	+ 3 15 45.0	+ 7.26	23 53.0
7	0 39 15.74	1.089	1 48 5.7	7.17	1 40.8	7	0 53 23.19	1.160	3 18 39.1	7.25	23 49.5
8	0 39 41.94	1.094	1 50 58.0	7.19	1 37.3	8	0 53 51.05	1.160	3 21 32.9	7.23	23 46.0
9	0 40 8.25	1.099	1 53 50.8	7.21	1 33.8	9	0 54 18.91	1.159	3 24 26.3	7.22	23 42.6
10	0 40 34.67	1.104	1 56 44.0	7.23	1 30.3	10	0 54 46.75	1.159	3 27 19.3	7.20	23 39.1
11	0 41 1.20	+ 1.108	+ 1 59 37.6	+ 7.25	1 26.8	11	0 55 14.57	+ 1.158	+ 3 30 11.9	+ 7.18	23 35.6
12	0 41 27.84	1.112	2 2 31.6	7.27	1 23.3	12	0 55 42.37	1.158	3 33 4.0	7.16	23 32.1
13	0 41 54.58	1.116	2 5 26.0	7.28	1 19.8	13	0 56 10.14	1.157	3 35 55.7	7.14	23 28.7
14	0 42 21.41	1.120	2 8 20.7	7.29	1 16.3	14	0 56 37.88	1.156	3 38 46.8	7.12	23 25.2
15	0 42 48.33	1.124	2 11 15.7	7.30	1 12.8	15	0 57 5.59	1.154	3 41 37.4	7.10	23 21.7
16	0 43 15.34	+ 1.127	+ 2 14 11.0	+ 7.31	1 9.3	16	0 57 33.26	+ 1.152	+ 3 44 27.5	+ 7.08	23 18.2
17	0 43 42.44	1.131	2 17 6.6	7.32	1 5.8	17	0 58 0.89	1.150	3 47 17.1	7.06	23 14.8
18	0 44 9.62	1.134	2 20 2.4	7.33	1 2.3	18	0 58 28.48	1.148	3 50 6.0	7.03	23 11.3
19	0 44 36.87	1.137	2 22 58.3	7.33	0 58.8	19	0 58 56.01	1.146	3 52 54.3	7.00	23 7.8
20	0 45 4.20	1.140	2 25 54.4	7.34	0 55.4	20	0 59 23.49	1.144	3 55 41.9	6.97	23 4.3
21	0 45 31.59	+ 1.143	+ 2 28 50.7	+ 7.34	0 51.9	21	0 59 50.91	+ 1.141	+ 3 58 28.8	+ 6.94	23 0.8
22	0 45 59.04	1.145	2 31 47.1	7.35	0 48.4	22	1 0 18.26	1.138	4 1 15.1	6.91	22 57.3
23	0 46 26.54	1.147	2 34 43.5	7.35	0 44.9	23	1 0 45.54	1.135	4 4 0.5	6.88	22 53.8
24	0 46 54.11	1.149	2 37 40.0	7.35	0 41.5	24	1 1 12.75	1.132	4 6 45.2	6.85	22 50.4
25	0 47 21.72	1.151	2 40 36.5	7.35	0 38.0	25	1 1 39.90	1.129	4 9 29.1	6.82	22 46.9
26	0 47 49.38	+ 1.153	+ 2 43 32.9	+ 7.35	0 34.5	26	1 2 6.96	+ 1.126	+ 4 12 12.2	+ 6.79	22 43.4
27	0 48 17.08	1.155	2 46 29.3	7.34	0 31.0	27	1 2 33.93	1.122	4 14 54.4	6.75	22 39.9
28	0 48 44.81	1.157	2 49 25.7	7.34	0 27.6	28	1 3 0.81	1.118	4 17 35.8	6.71	22 36.4
29	0 49 12.57	1.158	2 52 21.9	7.34	0 24.1	29	1 3 27.60	1.114	4 20 16.3	6.67	22 32.9
30	0 49 40.36	1.159	2 55 18.0	7.33	0 20.6	30	1 3 54.30	1.110	4 22 55.9	6.63	22 29.4
31	0 50 8.17	+ 1.159	+ 2 58 14.0	+ 7.32	0 17.2	31	1 4 20.89	+ 1.106	+ 4 25 34.5	+ 6.59	22 25.9
32	0 50 36.00	+ 1.160	+ 3 1 9.8	+ 7.31	0 13.8	32	1 4 47.38	+ 1.102	+ 4 28 12.2	+ 6.55	22 22.4

Day of the Month.	8th.	16th.	24th.
	″	″	″
Semidiameter	7.58	7.55	7.53
Horizontal Parallax	0.85	0.85	0.85

Day of the Month.	1st.	9th.	17th.	25th.
	″	″	″	″
Semidiameter	7.52	7.52	7.53	7.55
Horizontal Parallax . . .	0.85	0.85	0.85	0.85

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing or south declinations are decreasing. The sign — indicates that north declinations are decreasing or south declinations increasing.

GREENWICH MEAN TIME.

MAY.						JUNE.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	*Noon.*	*Noon.*	*Noon.*			*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
1	1 4 20.89	+ 1.106	+ 4 25 34.5	+ 6.59	22 25.9	1	1 16 55.50	+ 0.896	+ 5 37 54.4	+ 4.93	20 36.6
2	1 4 47.38	1.102	4 28 12.2	6.55	22 22.4	2	1 17 16.89	0.887	5 39 51.9	4.86	20 33.0
3	1 5 13.77	1.097	4 30 49.0	6.51	22 18.9	3	1 17 38.06	0.878	5 41 47.8	4.80	20 29.4
4	1 5 40.05	1.093	4 33 24.7	6.47	22 15.4	4	1 17 59.00	0.868	5 43 42.1	4.73	20 25.8
5	1 6 6.21	1.089	4 35 59.4	6.43	22 11.9	5	1 18 19.71	0.858	5 45 34.7	4.66	20 22.2
6	1 6 32.25	+ 1.084	+ 4 38 33.1	+ 6.39	22 8.5	6	1 18 40.18	+ 0.848	+ 5 47 25.6	+ 4.59	20 18.6
7	1 6 58.18	1.079	4 41 5.7	6.34	22 5.0	7	1 19 0.42	0.838	5 49 14.8	4.52	20 15.0
8	1 7 23.98	1.074	4 43 37.3	6.29	22 1.5	8	1 19 20.42	0.828	5 51 2.4	4.45	20 11.4
9	1 7 49.65	1.068	4 46 7.8	6.25	21 58.0	9	1 19 40.17	0.818	5 52 48.3	4.38	20 7.8
10	1 8 15.20	1.062	4 48 37.2	6.20	21 54.5	10	1 19 59.66	0.807	5 54 32.4	4.31	20 4.2
11	1 8 40.61	+ 1.056	+ 4 51 5.4	+ 6.15	21 51.0	11	1 20 18.90	+ 0.796	+ 5 56 14.7	+ 4.23	20 0.6
12	1 9 5.88	1.050	4 53 32.4	6.10	21 47.5	12	1 20 37.89	0.785	5 57 55.2	4.15	19 57.0
13	1 9 31.00	1.044	4 55 58.2	6.05	21 44.0	13	1 20 56.61	0.774	5 59 33.9	4.08	19 53.4
14	1 9 55.97	1.038	4 58 22.8	6.00	21 40.4	14	1 21 15.07	0.763	6 1 10.8	4.00	19 49.7
15	1 10 20.79	1.032	5 0 46.3	5.95	21 36.9	15	1 21 33.25	0.752	6 2 45.9	3.92	19 46.0
16	1 10 45.46	+ 1.025	+ 5 3 8.5	+ 5.90	21 33.4	16	1 21 51.16	+ 0.741	+ 6 4 19.2	+ 3.84	19 42.4
17	1 11 9.96	1.018	5 5 29.4	5.85	21 29.9	17	1 22 8.79	0.729	6 5 50.6	3.76	19 38.7
18	1 11 34.30	1.011	5 7 49.0	5.79	21 26.3	18	1 22 26.14	0.717	6 7 20.0	3.68	19 35.1
19	1 11 58.48	1.004	5 10 7.4	5.74	21 22.8	19	1 22 43.20	0.705	6 8 47.5	3.60	19 31.4
20	1 12 22.48	0.997	5 12 24.3	5.68	21 19.2	20	1 22 59.98	0.693	6 10 13.1	3.52	19 27.8
21	1 12 46.30	+ 0.989	+ 5 14 39.8	+ 5.62	21 15.7	21	1 23 16.46	+ 0.681	+ 6 11 36.8	+ 3.44	19 24.1
22	1 13 9.94	0.981	5 16 54.0	5.56	21 12.1	22	1 23 32.65	0.668	6 12 58.5	3.36	19 20.5
23	1 13 33.39	0.973	5 19 6.8	5.50	21 8.6	23	1 23 48.53	0.656	6 14 18.2	3.28	19 16.8
24	1 13 56.66	0.965	5 21 18.1	5.44	21 5.0	24	1 24 4.11	0.643	6 15 35.8	3.20	19 13.1
25	1 14 19.73	0.957	5 23 27.9	5.38	21 1.5	25	1 24 19.38	0.630	6 16 51.5	3.12	19 9.4
26	1 14 42.60	+ 0.949	+ 5 25 36.3	+ 5.32	20 57.9	26	1 24 34.35	+ 0.617	+ 6 18 5.2	+ 3.03	19 5.7
27	1 15 5.27	0.941	5 27 43.2	5.26	20 54.4	27	1 24 49.00	0.604	6 19 16.9	2.94	19 2.0
28	1 15 27.74	0.932	5 29 48.5	5.19	20 50.8	28	1 25 3.34	0.591	6 20 26.5	2.86	18 58.3
29	1 15 50.00	0.923	5 31 52.3	5.13	20 47.3	29	1 25 17.37	0.578	6 21 34.1	2.78	18 54.6
30	1 16 12.05	0.914	5 33 54.6	5.06	20 43.7	30	1 25 31.08	0.565	6 22 39.6	2.69	18 50.9
31	1 16 33.88	+ 0.905	+ 5 35 55.3	+ 5.00	20 40.2	31	1 25 44.46	+ 0.551	+ 6 23 43.0	+ 2.60	18 47.2
32	1 16 55.50	+ 0.896	+ 5 37 54.4	+ 4.93	20 36.6	32	1 25 57.51	+ 0.537	+ 6 24 44.2	+ 2.51	18 43.5

Day of the Month.	3d.	11th.	19th.	27th.	Day of the Month.	4th.	12th.	20th.	28th.
	″	″	″	″		″	″	″	″
Semidiameter	7.59	7.64	7.70	7.77	Semidiameter	7.85	7.94	8.04	8.15
Horizontal Parallax . .	0.85	0.86	0.87	0.87	Horizontal Parallax . .	0.88	0.89	0.90	0.92

Note.—The sign + indicates north declinations; the sign — indicates south declinations.

GREENWICH MEAN TIME.

	JULY.						AUGUST.				
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	*Noon.*	*Noon.*	*Noon.*			*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
1	1 25 44.46	+0.551	+6 23 43.0	+2.60	18 47.2	1	1 29 44.27	+0.081	+6 38 24.6	−0.27	16 49.2
2	1 25 57.51	0.537	6 24 44.2	2.51	18 43.5	2	1 29 46.00	0.065	6 38 17.0	0.36	16 45.3
3	1 26 10.24	0.523	6 25 43.4	2.43	18 39.8	3	1 29 47.35	0.049	6 38 7.1	0.46	16 41.4
4	1 26 22.63	0.509	6 26 40.6	2.34	18 36.1	4	1 29 48.31	0.032	6 37 54.9	0.55	16 37.5
5	1 26 34.69	0.495	6 27 35.6	2.25	18 32.3	5	1 29 48.88	+0.015	6 37 40.5	0.65	16 33.6
6	1 26 46.41	+0.481	+6 28 28.5	+2.16	18 28.6	6	1 29 49.06	−0.001	+6 37 23.9	−0.74	16 29.6
7	1 26 57.79	0.467	6 29 19.3	2.07	18 24.8	7	1 29 48.84	0.018	6 37 5.1	0.83	16 25.7
8	1 27 8.83	0.453	6 30 7.9	1.98	18 21.1	8	1 29 48.24	0.034	6 36 43.9	0.93	16 21.7
9	1 27 19.53	0.439	6 30 54.3	1.89	18 17.3	9	1 29 47.25	0.050	6 36 20.5	1.02	16 17.8
10	1 27 29.88	0.424	6 31 38.6	1.80	18 13.6	10	1 29 45.87	0.066	6 35 54.9	1.12	16 13.8
11	1 27 39.87	+0.409	+6 32 20.7	+1.71	18 9.8	11	1 29 44.10	−0.082	+6 35 27.1	−1.21	16 9.9
12	1 27 49.51	0.394	6 33 0.6	1.62	18 6.0	12	1 29 41.94	0.098	6 34 57.0	1.30	16 5.9
13	1 27 58.79	0.379	6 33 38.3	1.53	18 2.2	13	1 29 39.39	0.114	6 34 24.7	1.39	16 1.9
14	1 28 7.71	0.364	6 34 13.8	1.44	17 58.4	14	1 29 36.45	0.130	6 33 50.2	1.48	15 57.9
15	1 28 16.27	0.349	6 34 47.0	1.34	17 54.6	15	1 29 33.13	0.146	6 33 13.6	1.57	15 53.9
16	1 28 24.46	+0.334	+6 35 17.9	+1.25	17 50.8	16	1 29 29.42	−0.163	+6 32 34.7	−1.66	15 49.9
17	1 28 32.28	0.318	6 35 46.6	1.15	17 47.0	17	1 29 25.33	0.179	6 31 53.7	1.75	15 45.9
18	1 28 39.73	0.303	6 36 13.1	1.06	17 43.2	18	1 29 20.86	0.195	6 31 10.6	1.84	15 41.9
19	1 28 46.81	0.288	6 36 37.3	0.96	17 39.4	19	1 29 16.00	0.211	6 30 25.3	1.93	15 37.9
20	1 28 53.51	0.272	6 36 59.2	0.87	17 35.6	20	1 29 10.77	0.226	6 29 38.0	2.02	15 33.9
21	1 28 59.84	+0.256	+6 37 18.8	+0.77	17 31.8	21	1 29 5.17	−0.241	+6 28 48.6	−2.10	15 29.9
22	1 29 5.79	0.240	6 37 36.2	0.67	17 28.0	22	1 28 59.19	0.257	6 27 57.1	2.19	15 25.8
23	1 29 11.35	0.224	6 37 51.3	0.58	17 24.1	23	1 28 52.84	0.272	6 27 3.5	2.28	15 21.8
24	1 29 16.54	0.208	6 38 4.1	0.48	17 20.3	24	1 28 46.13	0.287	6 26 8.0	2.36	15 17.7
25	1 29 21.35	0.192	6 38 14.6	0.39	17 16.4	25	1 28 39.06	0.302	6 25 10.5	2.44	15 13.7
26	1 29 25.78	+0.176	+6 38 22.9	+0.29	17 12.6	26	1 28 31.64	−0.317	+6 24 10.9	−2.52	15 9.6
27	1 29 29.82	0.160	6 38 28.9	0.20	17 8.7	27	1 28 23.86	0.332	6 23 9.3	2.60	15 5.6
28	1 29 33.48	0.145	6 38 32.6	0.11	17 4.8	28	1 28 15.72	0.347	6 22 5.9	2.68	15 1.5
29	1 29 36.76	0.129	6 38 34.0	+0.01	17 0.9	29	1 28 7.24	0.361	6 21 0.7	2.76	14 57.4
30	1 29 39.65	0.113	6 38 33.1	−0.08	16 57.0	30	1 27 58.41	0.375	6 19 53.6	2.84	14 53.3
31	1 29 42.15	+0.097	+6 38 30.0	−0.18	16 53.1	31	1 27 49.24	−0.389	+6 18 44.7	−2.91	14 49.2
32	1 29 44.27	+0.081	+6 38 24.6	−0.27	16 49.2	32	1 27 39.74	−0.403	+6 17 34.0	−2.99	14 45.1

Day of the Month.	6th.	14th.	22d.	30th.	Day of the Month.	7th.	15th.	23d.	31st.
	″	″	″	″		″	″	″	″
Semidiameter	8.25	8.36	8.49	8.61	Semidiameter	8.73	8.85	8.96	9.06
Horizontal Parallax . .	0.93	0.94	0.96	0.97	Horizontal Parallax . .	0.98	1.00	1.01	1.02

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing or south declinations are decreasing. The sign — indicates that north declinations are decreasing or south declinations increasing.

GREENWICH MEAN TIME.

	SEPTEMBER.						OCTOBER.				
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	*Noon.*	*Noon.*	*Noon.*			*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
1	1 27 39.74	−0.403	+6 17 34.0	−2.99	14 45.1	1	1 20 45.20	−0.704	+5 31 16.4	−4.44	12 40.2
2	1 27 29.91	0.417	6 16 21.6	3.06	14 41.0	2	1 20 28.24	0.709	5 29 29.5	4.46	12 36.0
3	1 27 19.75	0.431	6 15 7.4	3.13	14 36.9	3	1 20 11.16	0.714	5 27 42.3	4.48	12 31.8
4	1 27 9.26	0.444	6 13 51.4	3.20	14 32.8	4	1 19 53.97	0.718	5 25 54.8	4.49	12 27.6
5	1 26 58.45	0.457	6 12 33.8	3.27	14 28.7	5	1 19 36.69	0.722	5 24 7.0	4.50	12 23.3
6	1 26 47.33	−0.470	+6 11 14.6	−3.34	14 24.6	6	1 19 19.33	−0.725	+5 22 18.9	−4.50	12 19.1
7	1 26 35.90	0.483	6 9 53.7	3.41	14 20.4	7	1 19 1.88	0.728	5 20 30.7	4.50	12 14.9
8	1 26 24.16	0.496	6 8 31.2	3.48	14 16.3	8	1 18 44.35	0.731	5 18 42.5	4.51	12 10.7
9	1 26 12.12	0.508	6 7 7.1	3.54	14 12.2	9	1 18 26.77	0.734	5 16 54.2	4.51	12 6.5
10	1 25 59.79	0.520	6 5 41.5	3.60	14 8.1	10	1 18 9.14	0.736	5 15 5.9	4.51	12 2.3
11	1 25 47.16	−0.532	+6 4 14.5	−3.66	14 3.9	11	1 17 51.47	−0.737	+5 13 17.7	−4.50	11 58.0
12	1 25 34.25	0.544	6 2 46.0	3.72	13 59.8	12	1 17 33.76	0 738	5 11 29.7	4.49	11 53.8
13	1 25 21.06	0.555	6 1 16.1	3.78	13 55.6	13	1 17 16.03	0.738	5 9 41.9	4.48	11 49.5
14	1 25 7.61	0.566	5 59 44.9	3.83	13 51.5	14	1 16 58.29	0.739	5 7 54.4	4.47	11 45.3
15	1 24 53.90	0.577	5 58 12.4	3.88	13 47.3	15	1 16 40.55	0.739	5 6 7.3	4.45	11 41.0
16	1 24 39.93	−0.587	+5 56 38.6	−3.93	13 43.2	16	1 16 22.82	−0.738	+5 4 20.6	−4.43	11 36.8
17	1 24 25.71	0.597	5 55 3.6	3.98	13 39.0	17	1 16 5.11	0.737	5 2 34.3	4.41	11 32.6
18	1 24 11.26	0.607	5 53 27.5	4.03	13 34.8	18	1 15 47.44	0.736	5 0 48.3	4.39	11 28.4
19	1 23 56.58	0.617	5 51 50.3	4.08	13 30.6	19	1 15 29.81	0.734	4 59 3.1	4.37	11 24.1
20	1 23 41.67	0.626	5 50 12.0	4.12	13 26.4	20	1 15 12.22	0.732	4 57 18.6	4.34	11 19.9
21	1 23 26.54	−0.635	+5 48 32.7	−4.16	13 22.2	21	1 14 54.69	−0.729	+4 55 34.8	−4.31	11 15.7
22	1 23 11.20	0.643	5 46 52.5	4.20	13 18.0	22	1 14 37.24	0.726	4 53 51.7	4.28	11 11.5
23	1 22 55.66	0.651	5 45 11.4	4.24	13 13.8	23	1 14 19.87	0.722	4 52 9.5	4.24	11 7.2
24	1 22 39.93	0.659	5 43 29.4	4.27	13 9.6	24	1 14 2.58	0.718	4 50 28.2	4.20	11 3.0
25	1 22 24.02	0.667	5 41 46.6	4.30	13 5.4	25	1 13 45.39	0.714	4 48 47.9	4.16	10 58.8
26	1 22 7.94	−0.674	+5 40 3.1	−4.33	13 1.2	26	1 13 28.32	−0.709	+4 47 8.5	−4.12	10 54.6
27	1 21 51.69	0.681	5 38 18.9	4.36	12 57.0	27	1 13 11.36	0.704	4 45 30.2	4.08	10 50.4
28	1 21 35.28	0.687	5 36 34.1	4.38	12 52.8	28	1 12 54.53	0.698	4 43 53.0	4.03	10 46.2
29	1 21 18.73	0.693	5 34 48.7	4.40	12 48.6	29	1 12 37.83	0.692	4 42 16.9	3.98	10 42.0
30	1 21 2.03	0.699	5 33 2.8	4.42	12 44.4	30	1 12 21.28	0.686	4 40 42.0	3.93	10 37.8
31	1 20 45.20	−0.704	+5 31 16.4	−4.44	12 40.2	31	1 12 4.87	−0.680	+4 39 8.3	−3.88	10 33.6
32	1 20 28.24	−0.709	+5 29 29.5	−4.46	12 36.0	32	1 11 48.62	−0.673	+4 37 36.0	−3.82	10 29.4

Day of the Month.	8th.	16th.	24th.	Day of the Month.	2d.	10th.	18th.	26th.
	″	″	″		″	″	″	″
Semidiameter	9.16	9.23	9.29	Semidiameter	9.33	9.35	9.35	9.34
Horizontal Parallax	1.03	1.04	1.05	Horizontal Parallax	1.05	1.05	1.05	1.05

NOTE.—The sign + indicates north declinations; the sign − indicates south declinations.

GREENWICH MEAN TIME.

NOVEMBER.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	1 11 48.62	−0.673	+4 37 36.0	−3.82	10 29.4
2	1 11 32.54	0.666	4 36 5.1	3.76	10 25.2
3	1 11 16.65	0.659	4 34 35.6	3.70	10 21.0
4	1 11 0.94	0.651	4 33 7.5	3.64	10 16.8
5	1 10 45.42	0.643	4 31 41.0	3.58	10 12.6
6	1 10 30.11	−0.634	+4 30 16.0	−3.51	10 8.4
7	1 10 15.01	0.625	4 28 52.5	3.44	10 4.3
8	1 10 0.12	0.615	4 27 30.7	3.37	10 0.1
9	1 9 45.47	0.605	4 26 10.7	3.30	9 55.9
10	1 9 31.06	0.595	4 24 52.4	3.23	9 51.7
11	1 9 16.90	−0.585	+4 23 35.9	−3.15	9 47.6
12	1 9 2.99	0.574	4 22 21.2	3.07	9 43.4
13	1 8 49.35	0.563	4 21 8.4	2.99	9 39.3
14	1 8 35.97	0.552	4 19 57.6	2.91	9 35.1
15	1 8 22.86	0.540	4 18 48.7	2.83	9 31.0
16	1 8 10.04	−0.528	+4 17 41.7	−2.75	9 26.8
17	1 7 57.52	0.516	4 16 36.9	2.66	9 22.7
18	1 7 45.29	0.504	4 15 34.3	2.57	9 18.6
19	1 7 33.36	0.491	4 14 33.8	2.48	9 14.5
20	1 7 21.74	0.478	4 13 35.4	2.39	9 10.4
21	1 7 10.45	−0.465	+4 12 39.2	−2.30	9 6.3
22	1 6 59.48	0.451	4 11 45.2	2.21	9 2.2
23	1 6 48.83	0.437	4 10 53.5	2.11	8 58.0
24	1 6 38.52	0.423	4 10 4.0	2.01	8 53.9
25	1 6 28.54	0.409	4 9 16.8	1.92	8 49.8
26	1 6 18.90	−0.395	+4 8 32.0	−1.82	8 45.7
27	1 6 9.60	0.380	4 7 49.5	1.72	8 41.6
28	1 6 0.65	0.365	4 7 9.3	1.62	8 37.5
29	1 5 52.06	0.350	4 6 31.5	1.52	8 33.5
30	1 5 43.83	0.335	4 5 56.1	1.42	8 29.4
31	1 5 35.97	−0.320	+4 5 23.2	−1.32	8 25.4
32	1 5 28.47	−0.305	+4 4 52.7	−1.22	8 21.3

Day of the Month.	3d.	11th.	19th.	27th.
	″	″	″	″
Semidiameter	9.29	9.23	9.14	9.04
Horizontal Parallax . .	1.05	1.04	1.03	1.02

DECEMBER.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	1 5 35.97	−0.320	+4 5 23.2	−1.32	8 25.4
2	1 5 28.47	0.305	4 4 52.7	1.22	8 21.3
3	1 5 21.34	0.290	4 4 24.7	1.12	8 17.3
4	1 5 14.59	0.274	4 3 59.1	1.01	8 13.2
5	1 5 8.21	0.258	4 3 36.0	0.91	8 9.2
6	1 5 2.22	−0.242	+4 3 15.4	−0.81	8 5.1
7	1 4 56.61	0.226	4 2 57.4	0.70	8 1.1
8	1 4 51.39	0.210	4 2 41.9	0.60	7 57.1
9	1 4 46.56	0.193	4 2 28.9	0.49	7 53.1
10	1 4 42.13	0.177	4 2 18.5	0.39	7 49.1
11	1 4 38.10	−0.161	+4 2 10.7	−0.28	7 45.1
12	1 4 34.47	0.144	4 2 5.5	0.17	7 41.1
13	1 4 31.23	0.127	4 2 2.8	−0.06	7 37.1
14	1 4 28.40	0.110	4 2 2.7	+0.05	7 33.1
15	1 4 25.97	0.093	4 2 5.2	0.16	7 29.2
16	1 4 23.95	−0.076	+4 2 10.4	+0.27	7 25.2
17	1 4 22.34	0.059	4 2 18.2	0.38	7 21.3
18	1 4 21.14	0.042	4 2 28.6	0.49	7 17.3
19	1 4 20.35	0.024	4 2 41.6	0.60	7 13.4
20	1 4 19.97	−0.007	4 2 57.2	0.71	7 9.4
21	1 4 19.99	+0.010	+4 3 15.3	+0.81	7 5.5
22	1 4 20.43	0.027	4 3 36.1	0.92	7 1.6
23	1 4 21.28	0.044	4 3 59.4	1.03	6 57.7
24	1 4 22.54	0.061	4 4 25.2	1.13	6 53.8
25	1 4 24.20	0.078	4 4 53.6	1.24	6 49.9
26	1 4 26.28	+0.095	+4 5 24.6	+1.35	6 46.0
27	1 4 28.76	0.112	4 5 58.1	1.45	6 42.1
28	1 4 31.65	0.129	4 6 34.1	1.56	6 38.2
29	1 4 34.94	0.146	4 7 12.6	1.66	6 34.3
30	1 4 38.64	0.163	4 7 53.6	1.76	6 30.4
31	1 4 42.74	+0.179	+4 8 37.1	+1.86	6 26.5
32	1 4 47.25	+0.196	+4 9 23.1	+1.97	6 22.7

Day of the Month.	5th.	13th.	21st.	29th.	37th.
	″	″	″	″	″
Semidiameter .	8.93	8.81	8.69	8.57	8.45
Hor. Parallax .	1.01	0.99	0.98	0.97	0.95

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing or south declinations are decreasing. The sign — indicates that north declinations are decreasing or south declinations increasing.

GREENWICH MEAN TIME.

Month and Day.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Day. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Day. Noon.	Meridian Passage.	Month and Day.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Day. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Day. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
Jan. 3	19 12 47.98	+ 15.342	− 22 48 15.4	+ 26.21	0 22.9	July 2	19 24 37.84	− 10.143	− 22 30 10.9	− 21.12	12 42.9
7	19 13 49.42	15.367	22 46 29.8	26.55	0 8.2	6	19 23 56.98	10.277	22 31 35.5	21.12	12 26.5
11	19 14 50.85	15.341	22 44 43.0	26.79	23 49.8	10	19 23 15.71	10.349	22 32 59.9	20.98	12 10.1
15	19 15 52.08	15.265	22 42 55.5	26.94	23 35.1	14	19 22 34.28	10.351	22 34 23.4	20.71	11 53.7
19	19 16 52.90	15.137	22 41 7.5	26.97	23 20.3	18	19 21 52.99	10.282	22 35 45.6	20.30	11 37.3
23	19 17 53.11	+ 14.957	− 22 39 19.7	+ 26.90	23 5.6	22	19 21 12.12	− 10.143	− 22 37 5.8	− 19.76	11 20.7
27	19 18 52.49	14.722	22 37 32.3	26.73	22 50.8	26	19 20 31.94	9.935	22 38 23.7	19.11	11 4.5
31	19 19 50.82	14.437	22 35 45.8	26.46	22 36.1	30	19 19 52.73	9.662	22 39 38.7	18.35	10 48.1
Feb. 4	19 20 47.92	14.105	22 34 0.6	26.09	22 21.3	Aug. 3	19 19 14.73	9.329	22 40 50.4	17.46	10 31.7
8	19 21 43.60	13.728	22 32 17.1	25.59	22 6.5	7	19 18 38.18	8.936	22 41 58.4	16.50	10 15.4
12	19 22 37.69	+ 13.307	− 22 30 35.9	+ 24.96	21 51.6	11	19 18 3.32	− 8.485	− 22 43 2.4	− 15.44	9 59.1
16	19 23 30.00	12.841	22 28 57.4	24.22	21 36.7	15	19 17 30.38	7.973	22 44 1.9	14.29	9 42.8
20	19 24 20.35	12.327	22 27 22.1	23.39	21 21.9	19	19 16 59.61	7.403	22 44 56.7	13.07	9 26.6
24	19 25 8.56	11.768	22 25 50.3	22.45	21 7.0	23	19 16 31.22	6.784	22 45 46.5	11.79	9 10.4
28	19 25 54.45	11.171	22 24 22.5	21.39	20 52.0	27	19 16 5.40	6.122	22 46 31.0	10.44	8 54.3
Mar. 4	19 26 37.88	+ 10.540	− 22 22 59.2	+ 20.21	20 37.0	31	19 15 42.30	− 5.421	− 22 47 10.0	− 9.05	8 38.2
8	19 27 18.72	9.873	22 21 40.8	18.94	20 21.9	Sept. 4	19 15 22.08	4.684	22 47 43.4	7.62	8 22.1
12	19 27 56.82	9.176	22 20 27.7	17.56	20 6.8	8	19 15 4.87	3.915	22 48 11.0	6.16	8 6.1
16	19 28 32.08	8.449	22 19 20.3	16.10	19 51.7	12	19 14 50.80	3.112	22 48 32.7	4.66	7 50.1
20	19 29 4.37	7.688	22 18 18.9	14.54	19 36.5	16	19 14 40.01	2.280	22 48 48.3	3.14	7 34.2
24	19 29 33.55	+ 6.898	− 22 17 23.8	+ 12.94	19 21.2	20	19 14 32.59	− 1.428	− 22 48 57.8	− 1.60	7 18.4
28	19 29 59.53	6.089	22 16 35.4	11.27	19 5.9	24	19 14 28.60	− 0.563	22 49 1.1	− 0.04	7 2.6
Apr. 1	19 30 22.24	5.265	22 15 53.8	9.51	18 50.5	28	19 14 28.09	+ 0.308	22 48 58.1	+ 1.54	6 46.9
5	19 30 41.63	4.427	22 15 19.3	7.72	18 35.1	Oct. 2	19 14 31.06	1.181	22 48 48.8	3.10	6 31.2
9	19 30 57.64	3.578	22 14 52.0	5.90	18 19.6	6	19 14 37.54	2.060	22 48 33.3	4.67	6 15.6
13	19 31 10.23	+ 2.719	− 22 14 32.1	+ 4.04	18 4.1	10	19 14 47.54	+ 2.941	− 22 48 11.4	+ 6.25	6 0.0
17	19 31 19.38	1.850	22 14 19.7	2.16	17 58.5	14	19 15 1.06	3.817	22 47 43.3	7.81	5 44.5
21	19 31 25.03	0.975	22 14 14.8	+ 0.29	17 32.9	18	19 15 18.06	4.681	22 47 8.9	9.36	5 29.1
25	19 31 27.19	+ 0.107	22 14 17.4	− 1.59	17 17.2	22	19 15 38.49	5.529	22 46 28.4	10.91	5 13.7
29	19 31 25.90	− 0.750	22 14 27.5	3.44	17 1.4	26	19 16 2.28	6.357	22 45 41.6	12.45	4 58.4
May 3	19 31 21.21	− 1.592	− 22 14 44.9	− 5.24	16 45.6	30	19 16 29.32	+ 7.160	− 22 44 48.8	+ 13.95	4 43.1
7	19 31 13.18	2.419	22 15 9.4	7.00	16 29.7	Nov. 3	19 16 59.53	7.940	22 43 50.0	15.42	4 27.9
11	19 31 1.88	3.229	22 15 40.8	8.72	16 13.8	7	19 17 32.81	8.697	22 42 45.4	16.87	4 12.7
15	19 30 47.37	4.019	22 16 19.0	10.37	15 57.8	11	19 18 9.07	9.425	22 41 35.0	18.30	3 57.6
19	19 30 29.75	4.784	22 17 3.8	11.92	15 41.8	15	19 18 48.17	10.120	22 40 19.0	19.67	3 42.5
23	19 30 9.14	− 5.515	− 22 17 54.5	− 13.37	15 25.7	19	19 19 29.98	+ 10.776	− 22 38 57.6	+ 21.01	3 27.5
27	19 29 45.70	6.207	22 18 50.8	14.72	15 9.6	23	19 20 14.33	11.389	22 37 30.9	22.32	3 12.5
31	19 29 19.59	6.856	22 19 52.3	15.97	14 53.4	27	19 21 1.04	11.960	22 35 59.0	23.56	2 57.5
June 4	19 28 50.99	7.458	22 20 58.6	17.10	14 37.2	Dec. 1	19 21 49.95	12.491	22 34 22.4	24.77	2 42.6
8	19 28 20.07	8.010	22 22 9.1	18.10	14 21.0	5	19 22 40.91	12.982	22 32 40.8	25.92	2 27.7
12	19 27 47.03	− 8.512	− 22 23 23.4	− 18.96	14 4.7	9	19 23 33.75	+ 13.430	− 22 30 55.0	+ 26.97	2 12.9
16	19 27 12.06	8.964	22 24 40.8	19.69	13 48.4	13	19 24 28.29	13.828	22 29 5.0	27.97	1 58.1
20	19 26 35.40	9.356	22 26 0.9	20.27	13 32.1	17	19 25 24.31	14.173	22 27 11.2	28.90	1 43.3
24	19 25 57.30	9.681	22 27 23.0	20.70	13 15.7	21	19 26 21.61	14.467	22 25 13.8	29.75	1 28.5
28	19 25 18.03	9.943	22 28 46.5	20.99	12 59.3	25	19 27 19.98	14.711	22 23 13.2	30.50	1 13.7
July 2	19 24 37.84	− 10.143	− 22 30 10.9	− 21.12	12 42.9	29	19 28 19.23	+ 14.908	− 22 21 9.8	+ 31.16	0 59.0
6	19 23 56.98	− 10.277	− 22 31 35.5	− 21.12	12 26.5	33	19 29 19.17	+ 15.055	− 22 19 3.9	+ 31.74	0 44.2

Least semidiameter,	January	8,	1″.63	Least horizontal parallax,	January	8,	0″.43
Greatest semidiameter,	July	6,	1″.80	Greatest horizontal parallax,	July	6,	0″.47

GREENWICH MEAN TIME.

Month and Day.	Apparent Right Ascension.	Var. of R. A. for 1 Day.	Apparent Declination.	Var. of Decl. for 1 Day.	Meridian Passage.	Month and Day.	Apparent Right Ascension.	Var. of R. A. for 1 Day.	Apparent Declination.	Var. of Decl. for 1 Day.	Meridian Passage.
	Noon.	*Noon.*	*Noon.*	*Noon.*			*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
Jan. 3	7 8 12.54	−7.241	+21 44 25.0	+12.40	12 16.3	July 2	7 11 27.22	+9.484	+21 43 49.5	−15.46	0 31.8
7	7 7 43.53	7.257	21 45 14.7	12.45	12 0.1	6	7 12 5.24	9.524	21 42 47.0	15.76	0 16.7
11	7 7 14.55	7.227	21 46 4.6	12.45	11 43.8	10	7 12 43.37	9.533	21 41 43.4	16.01	0 1.7 23 57.9
15	7 6 45.78	7.149	21 46 54.3	12.37	11 27.6	14	7 13 21.47	9.510	21 40 38.9	16.21	23 42.8
19	7 6 17.42	7.023	21 47 43.6	12.21	11 11.4	18	7 13 59.42	9.454	21 39 33.7	16.36	23 27.7
23	7 5 49.65	−6.850	+21 48 32.0	+11.97	10 55.3	22	7 14 37.08	+9.365	+21 38 28.0	−16.44	23 12.6
27	7 5 22.66	6.632	21 49 19.3	11.66	10 39.1	26	7 15 14.31	9.245	21 37 22.2	16.43	22 57.5
31	7 4 56.64	6.371	21 50 5.3	11.30	10 23.0	30	7 15 51.00	9.094	21 36 16.6	16.35	22 42.3
Feb. 4	7 4 31.75	6.070	21 50 49.7	10.87	10 6.8	Aug. 3	7 16 27.02	8.911	21 35 11.4	16.22	22 27.2
8	7 4 8.14	5.732	21 51 32.3	10.39	9 50.7	7	7 17 2.25	8.698	21 34 6.8	16.05	22 12.0
12	7 3 45.95	−5.359	+21 52 12.8	+ 9.85	9 34.6	11	7 17 36.58	+8.455	+21 33 3.0	−15.80	21 56.9
16	7 3 25.33	4.951	21 52 51.1	9.27	9 18.6	15	7 18 9.88	8.183	21 32 0.4	15.47	21 41.7
20	7 3 6.42	4.508	21 53 27.0	8.64	9 2.5	19	7 18 42.02	7.881	21 30 59.2	15.09	21 26.5
24	7 2 49.35	4.033	21 54 0.3	7.96	8 46.5	23	7 19 12.89	7.549	21 29 59.7	14.63	21 11.3
28	7 2 34.22	3.533	21 54 30.7	7.25	8 30.5	27	7 19 42.37	7.190	21 29 2.2	14.10	20 56.1
Mar. 4	7 2 21.11	−3.016	+21 54 58.2	+ 6.51	8 14.6	31	7 20 10.38	+6.806	+21 28 6.9	−13.51	20 40.8
8	7 2 10.10	2.483	21 55 22.8	5.75	7 58.7	Sept. 4	7 20 36.81	6.397	21 27 14.1	12.86	20 25.6
12	7 2 1.25	1.935	21 55 44.3	4.96	7 42.8	8	7 21 1.55	5.963	21 26 24.0	12.14	20 10.1
16	7 1 54.62	1.372	21 56 2.5	4.15	7 27.0	12	7 21 24.50	5.508	21 25 37.0	11.35	19 54.8
20	7 1 50.27	0.795	21 56 17.4	3.31	7 11.2	16	7 21 45.58	5.033	21 24 53.2	10.52	19 39.4
24	7 1 48.23	−0.211	+21 56 29.0	+ 2.47	6 55.4	20	7 22 4.72	+4.538	+21 24 12.8	− 9.64	19 24.0
28	7 1 48.52	+0.370	21 56 37.2	1.62	6 39.7	24	7 22 21.85	4.023	21 23 36.1	8.69	19 8.5
Apr. 1	7 1 51.14	0.946	21 56 42.0	+ 0.76	6 24.0	28	7 22 36.89	3.492	21 23 3.3	7.69	18 53.1
5	7 1 56.06	1.518	21 56 43.3	− 0.11	6 8.3	Oct. 2	7 22 49.78	2.949	21 22 34.6	6.65	18 37.5
9	7 2 3.27	2.086	21 56 41.1	0.98	5 52.6	6	7 23 0.47	2.394	21 22 10.1	5.59	18 22.0
13	7 2 12.74	+2.649	+21 56 35.4	− 1.85	5 37.1	10	7 23 8.92	+1.828	+21 21 49.9	− 4.49	18 6.4
17	7 2 24.45	3.202	21 56 26.3	2.71	5 21.5	14	7 23 15.08	1.252	21 21 34.2	3.36	17 50.8
21	7 2 38.35	3.743	21 56 13.7	3.58	5 6.0	18	7 23 18.93	0.672	21 21 23.2	2.20	17 35.1
25	7 2 54.39	4.270	21 55 57.6	4.44	4 50.6	22	7 23 20.47	+0.093	21 21 16.8	− 1.03	17 19.4
29	7 3 12.49	4.779	21 55 38.1	5.29	4 35.2	26	7 23 19.68	−0.484	21 21 15.0	+ 0.14	17 3.6
May 3	7 3 32.58	+5.266	+21 55 15.3	− 6.13	4 19.9	30	7 23 16.59	−1.056	+21 21 17.8	+ 1.31	16 47.8
7	7 3 54.58	5.732	21 54 49.1	6.96	4 4.5	Nov. 3	7 23 11.23	1.621	21 21 25.3	2.47	16 32.0
11	7 4 18.40	6.177	21 54 19.6	7.76	3 49.2	7	7 23 3.62	2.177	21 21 37.5	3.60	16 16.2
15	7 4 43.97	6.601	21 53 47.0	8.53	3 33.9	11	7 22 53.82	2.720	21 21 54.1	4.70	16 0.3
19	7 5 11.19	7.002	21 53 11.3	9.27	3 18.6	15	7 22 41.88	3.250	21 22 15.1	5.77	15 44.4
23	7 5 39.96	+7.373	+21 52 32.7	−10.00	3 3.3	19	7 22 27.87	−3.734	+21 22 40.3	+ 6.82	15 28.4
27	7 6 10.15	7.715	21 51 51.3	10.72	2 48.1	23	7 22 11.88	4.232	21 23 9.7	7.84	15 12.4
31	7 6 41.65	8.029	21 51 7.0	11.41	2 32.9	27	7 21 54.03	4.685	21 23 43.0	8.77	14 56.3
June 4	7 7 14.36	8.315	21 50 20.0	12.06	2 17.7	Dec. 1	7 21 34.42	5.112	21 24 19.9	9.65	14 40.3
8	7 7 48.16	8.575	21 49 30.5	12.67	2 2.5	5	7 21 13.16	5.509	21 25 0.2	10.45	14 24.2
12	7 8 22.94	+8.807	+21 48 38.7	−13.24	1 47.4	9	7 20 50.38	−5.871	+21 25 43.5	+11.19	14 8.1
16	7 8 58.59	9.009	21 47 44.6	13.77	1 32.3	13	7 20 26.23	6.194	21 26 29.7	11.86	13 52.0
20	7 9 34.97	9.177	21 46 48.4	14.26	1 17.2	17	7 20 0.88	6.474	21 27 18.4	12.44	13 35.8
24	7 10 11.96	9.312	21 45 50.4	14.71	1 2.0	21	7 19 34.49	6.712	21 28 9.2	12.92	13 19.7
28	7 10 49.42	9.413	21 44 50.7	15.11	0 46.9	25	7 19 7.24	6.906	21 29 1.8	13.34	13 3.5
July 2	7 11 27.22	+9.484	+21 43 49.5	−15.46	0 31.8	29	7 18 39.30	−7.056	+21 29 55.9	+13.66	12 47.3
6	7 12 5.24	+9.524	+21 42 47.0	−15.76	0 16.7	33	7 18 10.85	−7.161	+21 30 51.1	+13.86	12 31.1

Greatest semidiameter,	January	6,	1″.33	Greatest horizontal parallax,	January	6,	0″.31
Least semidiameter,	July	9,	1″.25	Least horizontal parallax,	July	9,	0″.29

MERCURY.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth— At Date.	Logarithm of Distance from Earth— At Intermediate Date.
	° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″			
Jan. 1	296 29 18.5	3 7 36.5	+ 8 30.6	− 6 33 8.2	− 8 3.8	9.642 7894	0.148 8541	0.147 7670
2	299 38 37.7	3 11 4.7	7 24.1	6 40 40.6	7 0.2	9.638 9188	0.146 6249	0.145 4269
3	302 51 33.9	3 14 50.6	6 10.7	6 47 7.1	5 51.9	9.634 7800	0.144 1718	0.142 8584
4	306 8 25.0	3 18 54.6	4 51.1	6 52 22.8	4 38.5	9.630 3744	0.141 4855	0.140 0516
5	309 29 29.4	3 23 17.4	3 25.9	6 56 22.3	3 19.4	9.625 7041	0.138 5554	0.136 9954
6	312 55 6.4	3 27 59.9	+ 1 56.0	− 6 58 59.6	− 1 54.1	9.620 7724	0.135 3701	0.133 6779
7	316 25 36.1	3 33 2.8	+ 0 22.2	7 0 8.4	− 0 22.2	9.615 5838	0.131 9170	0.130 0858
8	320 1 19.1	3 38 26.6	− 1 14.3	6 59 41.8	+ 1 16.7	9.610 1445	0.128 1824	0.126 2049
9	323 42 36.6	3 44 11.9	2 52.0	6 57 32.6	2 3.1	9.604 4627	0.124 1513	0.122 0195
10	327 29 50.5	3 50 19.3	4 29.4	6 53 33.0	4 57.6	9.598 5491	0.119 8074	0.117 5128
11	331 23 23.1	3 56 49.3	− 6 4.6	− 6 47 34.7	+ 7 0.3	9.592 4172	0.115 1334	0.112 6669
12	335 23 36.9	4 3 41.9	7 35.6	6 39 29.4	9 11.6	9.586 0835	0.110 1108	0.107 4626
13	339 30 54.4	4 10 56.8	9 0.1	6 29 8.5	11 31.7	9.579 5689	0.104 7198	0.101 8796
14	343 45 37.6	4 18 33.5	10 15.5	6 16 23.2	14 0.4	9.572 8986	0.098 9393	0.095 8962
15	348 8 8.3	4 26 31.2	11 19.2	6 1 5.0	16 37.3	9.566 1027	0.092 7476	0.089 4905
16	352 38 46.8	4 34 48.7	− 12 8.4	− 5 43 6.2	+ 19 21.5	9.559 2168	0.086 1222	0.082 6397
17	357 17 51.8	4 43 23.9	12 40.3	5 22 19.9	22 12.1	9.552 2832	0.079 0401	0.075 3206
18	2 5 39.4	4 52 13.7	12 52.2	4 58 40.5	25 7.3	9.545 3509	0.071 4783	0.067 5106
19	7 2 22.7	5 1 14.4	12 42.0	4 32 4.5	28 4.8	9.538 4757	0.063 4148	0.059 1885
20	12 8 10.2	5 10 21.3	12 7.7	4 2 31.1	31 1.7	9.531 7213	0.054 8292	0.050 3348
21	17 23 5.4	5 19 28.8	− 11 8.3	− 3 30 2.5	+ 33 54.3	9.525 1580	0.045 7034	0.040 9333
22	22 47 5.7	5 28 30.0	9 43.7	2 54 45.4	36 38.0	9.518 8630	0.036 0233	0.030 9725
23	28 20 0.6	5 37 16.8	7 55.2	2 16 51.1	39 7.9	9.512 9188	0.025 7805	0.020 4473
24	34 1 31.3	5 45 40.1	5 45.2	1 36 36.3	41 18.0	9.507 4117	0.014 9737	0.009 3610
25	39 51 9.4	5 53 29.9	3 18.0	0 54 23.4	43 2.9	9.502 4300	0.003 6113	9.997 7274
26	45 48 16.3	6 0 35.8	− 0 39.2	− 0 10 40.7	+ 44 16.8	9.498 0598	9.991 7131	9.985 5733
27	51 52 2.8	6 6 47.2	+ 2 4.3	+ 0 33 58.1	44 54.2	9.494 3830	9.979 3137	9.972 9412
28	58 1 29.2	6 11 53.7	4 44.5	1 18 54.4	44 51.1	9.491 4725	9.966 4640	9.959 8914
29	64 15 25.6	6 15 45.9	7 13.2	2 3 26.2	44 4.9	9.489 3895	9.953 2341	9.946 5043
30	70 32 33.7	6 18 16.1	9 22.3	2 46 49.7	42 34.7	9.488 1792	9.939 7153	9.932 8821
31	76 51 28.6	6 19 18.6	+ 11 4.7	+ 3 28 21.5	+ 40 21.7	9.487 8686	9.926 0210	9.919 1497
Feb. 1	83 10 40.8	6 18 50.4	12 14.7	4 7 20.1	37 29.3	9.488 4648	9.912 2875	9.905 4548
2	89 28 39.2	6 16 51.5	12 48.9	4 43 8.9	34 2.9	9.489 9544	9.898 6732	9.891 9656
3	95 43 54.4	6 13 24.7	12 46.2	5 15 16.9	30 9.1	9.492 3039	9.885 3557	9.878 8683
4	101 55 1.1	6 8 35.7	12 7.9	5 43 20.5	25 55.6	9.495 4634	9.872 5285	9.866 3619
5	108 0 41.1	6 2 32.7	+ 10 57.1	+ 6 7 4.2	+ 21 30.5	9.499 3674	9.860 3940	9.854 6503
6	113 59 45.2	5 55 25.7	9 18.9	6 26 20.2	17 1.5	9.503 9398	9.849 1558	9.843 9347
7	119 51 14.9	5 47 25.9	7 19.4	6 41 8.1	12 35.4	9.509 0968	9.839 0097	9.834 4022
8	125 34 23.2	5 38 44.7	5 5.2	6 51 33.9	8 18.2	9.514 7513	9.830 1318	9.826 2159
9	131 8 34.4	5 29 33.7	2 42.9	6 57 49.1	4 14.7	9.520 8155	9.822 6697	9.819 5058
10	136 33 24.2	5 20 3.7	+ 0 18.7	+ 7 0 9.1	+ 0 28.3	9.527 2039	9.816 7336	9.814 3598
11	141 48 38.6	5 10 24.4	− 2 1.9	6 58 52.1	− 2′58.9	9.533 8356	9.812 3882	9.810 8196
12	146 54 12.7	5 0 44.4	4 14.3	6 54 17.8	6 6.0	9.540 6355	9.809 6517	9.808 8794
13	151 50 9.5	4 51 10.8	6 15.1	6 46 46.6	8 52.7	9.547 5351	9.808 4951	9.808 4888
14	156 36 38.5	4 41 49.6	8 1.6	6 36 38.9	11 19.3	9.554 4737	9.808 8482	9.809 5591
15	161 13 54.6	4 32 45.5	− 9 32.1	+ 6 24 14.3	− 13 26.8	9.561 3972	9.810 6058	9.811 9713
16	165 42 16.5	4 24 1.9	− 10 45.6	+ 6 9 51.2	− 15 16.4	9.568 2588	9.813 6373	9.815 5854

MERCURY.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
							At Date.	At Intermediate Date.
	° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″			
Feb. 15	161 13 54.6	4 32 45.5	− 9 32.1	+6 24 14.3	−13 26.8	9.561 3972	9.810 6058	9.811 9713
16	165 42 16.5	4 24 1.9	10 45.6	6 9 51.2	15 16.4	9.568 2588	9.813 6373	9.815 5854
17	170 2 6.1	4 15 41.2	11 42.0	5 53 47.0	16 49.4	9.575 0187	9.817 7962	9.820 2503
18	174 13 47.1	4 7 45.0	12 21.4	5 36 17.2	18 7.7	9.581 6431	9.822 9287	9.825 8124
19	178 17 44.6	4 0 14.4	12 44.5	5 17 35.9	19 12.6	9.588 1030	9.828 8827	9.832 1214
20	182 14 24.5	3 53 9.6	−12 52.3	+4 57 55.7	−20 5.6	9.594 3751	9.835 5114	9.839 0361
21	186 4 12.5	3 46 30.7	12 45.8	4 37 27.8	20 48.2	9.600 4398	9.842 6798	9.846 4276
22	189 47 34.5	3 40 17.4	12 26.4	4 16 22.2	21 21.6	9.606 2816	9.850 2657	9.854 1810
23	193 24 55.5	3 34 28.8	11 55.4	3 54 47.4	21 47.0	9.611 8879	9.858 1613	9.862 1954
24	196 56 40.3	3 29 4.7	11 14.2	3 32 50.8	22 5.4	9.617 2491	9.866 2730	9.870 3844
25	200 23 12.6	3 24 3.6	−10 24.1	+3 10 38.9	−22 17.7	9.622 3574	9.874 5210	9.878 6748
26	203 44 55.1	3 19 25.1	9 26.4	2 48 17.4	22 24.6	9.627 2071	9.882 8386	9.887 0059
27	207 2 10.0	3 15 8.1	8 22.3	2 25 51.3	22 27.1	9.631 7941	9.891 1707	9.895 3275
28	210 15 18.1	3 11 11.5	7 13.2	2 3 24.6	22 25.8	9.636 1155	9.899 4715	9.903 5985
Mar. 1	213 24 39.5	3 7 34.5	6 0.0	1 41 0.8	22 21.2	9.640 1698	9.907 7048	9.911 7869
2	216 30 33.3	3 4 16.2	− 4 43.9	+1 18 43.2	−22 13.7	9.643 9554	9.915 8417	9.919 8665
3	219 33 17.9	3 1 15.8	3 25.8	0 56 34.4	22 3.7	9.647 4724	9.923 8590	9.927 8172
4	222 33 10.7	2 58 32.5	2 6.6	0 34 36.8	21 51.4	9.650 7206	9.931 7394	9.935 6243
5	225 30 28.5	2 56 5.7	− 0 47.2	+0 12 52.3	21 37.2	9.653 7005	9.939 4704	9.943 2766
6	228 25 27.3	2 53 54.4	+ 0 31.6	−0 8 37.1	21 21.4	9.656 4129	9.947 0420	9.950 7661
7	231 18 22.4	2 51 58.3	+ 1 49.3	−0 29 50.1	−21 4.2	9.658 8587	9.954 4482	9.958 0877
8	234 9 28.7	2 50 16.6	3 5.0	0 50 45.1	20 45.6	9.661 0388	9.961 6844	9.965 2382
9	236 59 0.4	2 48 49.1	4 18.2	1 11 20.9	20 25.8	9.662 9542	9.968 7490	9.972 2166
10	239 47 11.4	2 47 35.1	5 28.3	1 31 36.3	20 4.9	9.664 6060	9.975 6411	9.979 0226
11	242 34 15.1	2 46 34.4	6 34.8	1 51 30.3	19 42.9	9.665 9951	9.982 3614	9.985 6576
12	245 20 24.6	2 45 46.7	+ 7 37.8	−2 11 1.7	−19 19.8	9.667 1223	9.988 9114	9.992 1232
13	248 5 52.7	2 45 11.6	8 35.0	2 30 9.5	18 55.7	9.667 9881	9.995 2933	9.998 4220
14	250 50 52.0	2 44 49.0	9 27.9	2 48 52.7	18 30.5	9.668 5933	0.001 5097	0.004 5569
15	253 35 34.9	2 44 38.8	10 15.5	3 7 10.2	18 4.2	9.668 9383	0.007 5639	0.010 5312
16	256 20 13.7	2 44 40.7	10 57.4	3 25 0.9	17 36.9	9.669 0233	0.013 4592	0.016 3481
17	259 5 0.5	2 44 54.9	+11 33.2	−3 42 23.6	−17 8.4	9.668 8482	0.019 1986	0.022 0111
18	261 50 7.7	2 45 21.3	12 2.7	3 59 17.2	16 38.5	9.668 4129	0.024 7860	0.027 5237
19	264 35 47.4	2 46 0.0	12 25.6	4 15 40.3	16 7.3	9.667 7173	0.030 2247	0.032 8892
20	267 22 11.9	2 46 51.1	12 41.6	4 31 31.4	15 34.5	9.666 7609	0.035 5177	0.038 1108
21	270 9 33.8	2 47 54.7	12 50.4	4 46 48.9	15 0.2	9.665 5430	0.040 6686	0.043 1916
22	272 58 5.6	2 49 11.2	+12 52.0	−5 1 31.1	−14 24.0	9.664 0629	0.045 6801	0.048 1346
23	275 48 0.3	2 50 40.4	12 46.0	5 15 36.2	13 45.8	9.662 3197	0.050 5552	0.052 9423
24	278 39 30.9	2 52 23.0	12 32.4	5 29 2.0	13 5.3	9.660 3125	0.055 2961	0.057 6169
25	281 32 51.1	2 54 19.4	12 11.1	5 41 46.1	12 22.5	9.658 0403	0.059 9048	0.062 1602
26	284 28 14.6	2 56 29.9	11 42.0	5 53 46.1	11 37.0	9.655 5021	0.064 3832	0.066 5739
27	287 25 55.9	2 58 55.0	+11 5.1	−6 4 59.1	−10 48.3	9.652 6968	0.068 7324	0.070 8589
28	290 26 9.7	3 1 35.1	10 20.5	6 15 21.9	9 56.5	9.649 6238	0.072 9533	0.075 0157
29	293 29 11.4	3 4 30.8	9 28.3	6 24 51.2	9 1.2	9.646 2824	0.077 0460	0.079 0441
30	296 35 16.8	3 7 42.8	8 28.6	6 33 23.2	8 2.0	9.642 6721	0.081 0100	0.082 9436
31	299 44 42.6	3 11 11.6	7 21.8	6 40 53.6	6 58.1	9.638 7931	0.084 8447	0.086 7129
Apr. 1	302 57 45.9	3 14 57.9	+ 6 8.3	−6 47 18.0	− 5 49.7	9.634 6461	0.088 5481	0.090 3499
2	306 14 44.5	3 19 2.5	+ 4 48.6	−6 52 31.4	− 4 36.1	9.630 2323	0.092 1180	0.093 8520

MERCURY.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth— At Date.	Logarithm of Distance from Earth— At Intermediate Date.
	° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″			
Apr. 1	302 57 45.9	3 14 57.9	+ 6 8.3	− 6 47 18.0	− 5 49.7	9.634 6461	0.088 5481	0.090 3499
2	306 14 44.5	3 19 2.5	4 48.6	6 52 31.4	4 36.1	9.630 2323	0.092 1180	0.093 8520
3	309 35 57.2	3 23 26.0	3 23.2	6 56 28.4	3 16.9	9.625 5539	0.095 5513	0.097 2154
4	313 1 43.1	3 28 9.1	1 53.1	6 59 3.1	1 51.4	9.620 6140	0.098 8438	0.100 4358
5	316 32 22.3	3 33 12.6	+ 0 19.2	7 0 9.0	− 0 19.3	9.615 4172	0.101 9907	0.103 5078
6	320 8 15.4	3 38 37.1	− 1 17.3	− 6 59 39.4	+ 1 19.7	9.609 9700	0.104 9863	0.106 4253
7	323 49 43.8	3 44 23.2	2 55.0	6 57 26.9	3 6.5	9.604 2808	0.107 8237	0.109 1806
8	327 37 9.2	3 50 31.3	4 32.4	6 53 23.7	5 1.3	9.598 3601	0.110 4948	0.111 7652
9	331 30 53.9	3 57 1.9	6 7.5	6 47 21.6	7 4.2	9.592 2215	0.112 9905	0.114 1693
10	335 31 20.6	4 3 55.1	7 38.3	6 39 12.2	9 15.9	9.585 8819	0.115 3003	0.116 3819
11	339 38 51.7	4 11 10.7	− 9 2.6	− 6 28 46.9	+ 11 36.3	9.579 3621	0.117 4124	0.118 3903
12	343 53 49.3	4 18 48.2	10 17.7	6 15 57.0	14 5.0	9.572 6874	0.119 3137	0.120 1807
13	348 16 35.0	4 26 46.7	11 20.9	6 0 34.0	16 42.0	9.565 8880	0.120 9893	0.121 7376
14	352 47 29.2	4 35 4.7	12 9.6	5 42 30.1	19 26.7	9.559 0000	0.122 4233	0.123 0441
15	357 26 50.3	4 43 40.2	12 40.9	5 21 38.5	22 17.4	9.552 0655	0.123 5978	0.124 0819
16	2 14 54.5	4 52 30.4	− 12 52.3	− 4 57 53.7	+ 25 12.8	9.545 1342	0.124 4940	0.124 8315
17	7 11 54.7	5 1 31.5	12 41.3	4 31 12.2	28 10.4	9.538 2621	0.125 0916	0.125 2716
18	12 17 59.4	5 10 38.5	12 6.2	4 1 33.2	31 7.2	9.531 5126	0.125 3688	0.125 3803
19	17 33 11.8	5 19 45.9	11 6.0	3 28 59.2	33 59.6	9.524 9565	0.125 3033	0.125 1349
20	22 57 29.0	5 28 46.8	9 40.7	2 53 37.0	36 42.9	9.518 6713	0.124 8721	0.124 5121
21	28 30 40.4	5 37 32.9	− 7 51.4	− 2 15 38.1	+ 39 12.0	9.512 7395	0.124 0520	0.123 4889
22	34 12 26.9	5 45 55.3	5 40.9	1 35 19.4	41 21.9	9.507 2477	0.122 8202	0.122 0431
23	40 2 19.7	5 53 43.9	3 13.2	0 53 3.0	43 6.0	9.502 2839	0.121 1551	0.120 1537
24	45 59 39.9	6 0 48.2	− 0 34.1	− 0 9 17.9	44 18.4	9.497 9342	0.119 0366	0.117 8017
25	52 3 37.9	6 6 57.7	+ 2 9.4	+ 0 35 21.9	44 54.8	9.494 2803	0.116 4470	0.114 9709
26	58 13 13.7	6 12 2.1	+ 4 49.4	+ 1 20 18.2	+ 44 50.5	9.491 3950	0.113 3718	0.111 6486
27	64 27 17.3	6 15 51.9	7 17.6	2 4 48.5	44 2.8	9.489 3390	0.109 8004	0.107 8265
28	70 44 30.1	6 18 19.4	9 25.9	2 48 9.2	42 31.1	9.488 1566	0.105 7265	0.103 5004
29	77 3 26.8	6 19 19.0	11 7.4	3 29 36.7	40 16.9	9.487 8745	0.101 1486	0.098 6716
30	83 22 37.9	6 18 48.0	12 16.3	4 8 30.0	37 23.4	9.488 4990	0.096 0703	0.093 3459
May 1	89 40 32.5	6 16 46.2	+ 12 49.4	+ 4 44 12.3	+ 33 56.0	9.490 0159	0.090 4999	0.087 5341
2	95 55 41.1	6 13 16.6	12 45.6	5 16 13.0	30 1.5	9.492 3918	0.084 4505	0.081 2514
3	102 6 38.6	6 8 25.3	12 6.1	5 44 8.8	25 47.5	9.495 5756	0.077 9393	0.074 5170
4	108 12 7.0	6 2 20.0	10 54.4	6 7 44.2	21 22.1	9.499 5019	0.070 9873	0.067 3533
5	114 10 57.7	5 55 11.2	9 15.5	6 26 51.8	16 53.1	9.504 0938	0.063 6180	0.059 7848
6	120 2 12.3	5 47 10.0	+ 7 15.4	+ 6 41 31.4	+ 12 27.2	9.509 2676	0.055 8571	0.051 8383
7	125 45 4.1	5 38 27.8	5 0.8	6 51 49.3	8 10.5	9.514 9361	0.047 7318	0.043 5412
8	131 18 58.0	5 29 16.0	2 38.4	6 57 56.9	4 7.5	9.521 0116	0.039 2700	0.034 9217
9	136 43 29.9	5 19 45.5	+ 0 14.3	7 0 9.9	+ 0 21.6	9.527 4087	0.030 4998	0.026 0077
10	141 58 26.0	5 10 6.2	− 2 6.1	6 58 46.4	− 3 5.1	9.534 0467	0.021 4488	0.016 8265
11	147 3 42.0	5 0 26.3	− 4 18.3	+ 6 54 6.3	− 6 11.5	9.540 8506	0.012 1441	0.007 4049
12	151 59 20.7	4 50 53.0	6 18.6	6 46 30.0	8 57.0	9.547 7523	0.002 6122	9.997 7691
13	156 45 32.1	4 41 32.4	8 4.6	6 36 17.8	11 23.5	9.554 6910	9.992 8787	9.987 9440
14	161 22 31.1	4 32 28.9	9 34.6	6 23 49.3	13 30.4	9.561 6132	9.982 9681	9.977 9538
15	165 50 36.7	4 23 45.9	10 47.6	6 9 22.9	15 19.5	9.568 4724	9.972 9041	9.967 8218
16	170 10 10.6	4 15 25.9	− 11 43.5	+ 5 53 15.7	− 16 52.2	9.575 2286	9.962 7098	9.957 5709
17	174 21 36.7	4 7 30.6	− 12 22.4	+ 5 35 43.5	− 18 9.9	9.581 8479	9.952 4080	9.947 2238

MERCURY.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth— At Date.	Logarithm of Distance from Earth— At Intermediate Date.
	° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″			
May 17	174 21 36.7	4 7 30.6	− 12 22.4	+ 5 35 43.5	− 18 9.9	9.581 8479	9.952 4080	9.947 2238
18	178 25 20.2	4 0 0.7	12 45.0	5 17 0.2	19 14.5	9.588 3021	9.942 0211	9.936 8026
19	182 21 46.8	3 52 56.7	12 52.3	4 57 18.4	20 7.2	9.594 5678	9.931 5713	9.926 3300
20	186 11 22.3	3 46 18.6	12 45.4	4 36 49.3	20 49.4	9.600 6257	9.921 0816	9.915 8289
21	189 54 32.5	3 40 6.1	12 25.6	4 15 42.7	21 22.5	9.606 4603	9.910 5748	9.905 3225
22	193 31 42.7	3 34 18.4	− 11 54.3	+ 3 54 7.0	− 21 47.5	9.612 0591	9.900 0750	9.894 8356
23	197 3 17.4	3 28 54.9	11 12.7	3 32 9.9	22 5.6	9.617 4124	9.889 6076	9.884 3942
24	200 29 40.3	3 23 54.7	10 22.4	3 9 57.7	22 17.8	9.622 5126	9.879 1989	9.874 0253
25	203 51 14.3	3 19 16.8	9 24.5	2 47 36.0	22 24.7	9.627 3540	9.868 8771	9.863 7583
26	207 8 21.2	3 15 0.4	8 20.3	2 25 9.7	22 27.1	9.631 9327	9.858 6728	9.853 6247
27	210 21 21.9	3 11 4.4	− 7 11.0	+ 2 2 43.0	− 22 25.7	9.636 2459	9.848 6182	9.843 6577
28	213 30 36.5	3 7 28.0	5 57.7	1 40 19.4	22 20.9	9.640 2916	9.838 7478	9.833 8932
29	216 36 24.2	3 4 10.4	4 41.5	1 18 2.1	22 13.3	9.644 0688	9.829 0987	9.824 3695
30	219 39 3.3	3 1 10.6	3 23.4	0 55 53.6	22 3.2	9.647 5772	9.819 7109	9.815 1282
31	222 38 51.1	2 58 27.7	2 4.2	0 33 56.4	21 50.9	9.650 8170	9.810 6269	9.806 2126
June 1	225 36 4.3	2 56 1.3	− 0 44.8	+ 0 12 12.4	− 21 36.8	9.653 7886	9.801 8912	9.797 6688
2	228 30 59.0	2 53 50.6	+ 0 34.0	− 0 9 16.6	21 21.0	9.656 4927	9.793 5513	9.789 5450
3	231 23 50.5	2 51 54.9	1 51.6	0 30 29.0	21 3.7	9.658 9302	9.785 6562	9.781 8912
4	234 14 53.7	2 50 13.8	3 7.2	0 51 23.5	20 45.0	9.661 1021	9.778 2565	9.774 7586
5	237 4 22.8	2 48 46.6	4 20.4	1 11 58.7	20 25.2	9.663 0094	9.771 4039	9.768 1988
6	239 52 31.5	2 47 33.0	+ 5 30.4	− 1 32 13.5	− 20 4.2	9.664 6530	9.765 1496	9.762 2626
7	242 39 33.3	2 46 32.7	6 36.8	1 52 6.7	19 42.1	9.666 0339	9.759 5439	9.756 9995
8	245 25 41.3	2 45 45.4	7 39.0	2 11 37.4	19 19.1	9.667 1529	9.754 6352	9.752 4565
9	248 11 8.4	2 45 10.7	8 36.7	2 30 44.5	18 54.9	9.668 0107	9.750 4687	9.748 6769
10	250 56 7.1	2 44 48.5	9 29.5	2 49 26.9	18 29.7	9.668 6078	9.747 0856	9.745 6989
11	253 40 49.7	2 44 38.6	+ 10 16.9	− 3 7 43.6	− 18 3.4	9.668 9446	9.744 5207	9.743 5542
12	256 25 28.5	2 44 41.0	10 58.6	3 25 33.5	17 36.0	9.669 0214	9.742 8024	9.742 2676
13	259 10 15.9	2 44 55.6	11 34.2	3 42 55.4	17 7.5	9.668 8383	9.741 9516	9.741 8558
14	261 55 23.9	2 45 22.4	12 3.5	3 59 48.0	16 37.7	9.668 3951	9.741 9810	9.742 3275
15	264 41 4.8	2 46 1.4	12 26.2	4 16 10.1	16 6.4	9.667 6915	9.742 8950	9.743 6824
16	267 27 30.9	2 46 52.9	+ 12 41.9	− 4 32 0.2	− 15 33.5	9.666 7270	9.744 6882	9.745 9106
17	270 14 54.8	2 47 57.0	12 50.6	4 47 16.7	14 59.1	9.665 5011	9.747 3472	9.748 9949
18	273 3 29.1	2 49 13.7	12 51.9	5 1 57.8	14 22.9	9.664 0130	9.750 8503	9.752 9093
19	275 53 26.5	2 50 43.3	12 45.7	5 16 1.7	13 44.6	9.662 2617	9.755 1678	9.757 6213
20	278 45 0.3	2 52 26.5	12 31.9	5 29 26.2	13 4.0	9.660 2464	9.760 2646	9.763 0922
21	281 38 24.1	2 54 23.3	+ 12 10.4	− 5 42 9.0	− 12 21.1	9.657 9661	9.766 0986	9.769 2781
22	284 33 51.7	2 56 34.2	11 41.0	5 54 7.6	11 35.5	9.655 4198	9.772 6245	9.776 1317
23	287 31 37.4	2 58 59.7	11 3.9	6 5 19.0	10 47.0	9.652 6065	9.779 7933	9.783 6028
24	290 31 56.2	3 1 40.3	10 19.0	6 15 40.2	9 55.1	9.649 5254	9.787 5538	9.791 6397
25	293 35 3.3	3 4 36.5	9 26.6	6 25 7.8	8 59.5	9.646 1758	9.795 8540	9.800 1903
26	296 41 14.7	3 7 48.9	+ 8 26.7	− 6 33 38.0	− 8 0.0	9.642 5574	9.804 6421	9.809 2027
27	299 50 46.9	3 11 18.2	7 19.6	6 41 6.5	6 56.2	9.638 6704	9.813 8658	9.818 6253
28	303 3 57.1	3 15 5.1	6 5.9	6 47 28.8	5 47.6	9.634 5154	9.823 4751	9.828 4093
29	306 21 3.3	3 19 10.3	4 46.0	6 52 39.9	4 33.7	9.630 0935	9.833 4220	9.838 5074
30	309 42 24.0	3 23 34.4	3 20.5	6 56 34.5	3 14.2	9.625 4068	9.843 6598	9.848 8738
July 1	313 8 18.6	3 28 18.0	+ 1 50.3	− 6 59 6.4	− 1 48.6	9.620 4591	9.854 1440	9.859 4653
2	316 39 7.0	3 33 22.2	+ 0 16.3	− 7 0 9.6	− 0 16.4	9.615 2547	9.864 8327	9.870 2412

MERCURY.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
							At Date.	At Intermediate Date.
	° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″			
July 1	313 8 18.6	3 28 18.0	+ 1 50.3	−6 59 6.4	− 1 48.6	9.620 4591	9.854 1440	9.859 4653
2	316 39 7.0	3 33 22.2	+ 0 16.3	7 0 9.6	− 0 16.4	9.615 2547	9.864 8327	9.870 2412
3	320 15 10.1	3 38 47.4	− 1 20.3	6 59 36.9	+ 1 23.0	9.609 8002	9.875 6861	9.881 1628
4	323 56 49.0	3 44 34.1	2 58.0	6 57 21.1	3 9.9	9.604 1039	9.886 6668	9.892 1936
5	327 44 25.6	3 50 42.9	4 35.3	6 53 14.4	5 4.9	9.598 1765	9.897 7389	9.903 2986
6	331 38 22.3	3 57 14.2	− 6 10.4	−6 47 8.5	+ 7 8.2	9.592 0317	9.908 8686	9.914 4450
7	335 39 1.6	4 4 8.1	7 41.0	6 38 55.1	9 20.1	9.585 6864	9.920 0237	9.925 6007
8	339 46 45.9	4 11 24.3	9 5.0	6 28 25.4	11 40.7	9.579 1617	9.931 1723	9.936 7347
9	344 1 57.5	4 19 2.4	10 19.8	6 15 30.9	14 9.8	9.572 4827	9.942 2843	9.947 8173
10	348 24 57.7	4 27 1.5	11 22.7	6 0 3.1	16 47.1	9.565 6802	9.953 3301	9.958 8189
11	352 56 7.0	4 35 20.2	− 12 10.9	−5 41 54.2	+ 19 31.8	9.558 7903	9.964 2802	9.969 7102
12	357 35 43.8	4 43 56.1	12 41.6	5 20 57.4	22 22.7	9.551 8555	9.975 1054	9.980 4620
13	2 24 4.1	4 52 46.6	12 52.3	4 57 7.2	25 18.3	9.544 9252	9.985 7763	9.991 0446
14	7 21 20.6	5 1 47.9	12 40.6	4 30 20.2	28 16.1	9.538 0559	9.996 2632	0.001 4284
15	12 27 41.9	5 10 55.2	12 4.8	4 0 35.8	31 13.0	9.531 3114	0.006 5362	0.011 5829
16	17 43 10.9	5 20 2.4	− 11 3.8	−3 27 56.6	+ 34 5.0	9.524 7626	0.016 5646	0.021 4774
17	23 7 44.4	5 29 2.8	9 37.7	2 52 29.4	36 47.8	9.518 4870	0.026 3175	0.031 0810
18	28 41 11.6	5 37 48.4	7 47.7	2 14 25.9	39 16.4	9.512 5674	0.035 7640	0.040 3627
19	34 23 13.2	5 46 9.9	5 36.6	1 34 3.1	41 25.3	9.507 0904	0.044 8732	0.049 2918
20	40 13 20.1	5 53 57.4	3 8.5	0 51 43.8	43 8.5	9.502 1437	0.053 6147	0.057 8384
21	46 10 53.1	6 1 0.2	− 0 29.2	−0 7 56.6	+ 44 20.2	9.497 8145	0.061 9593	0.065 9741
22	52 15 2.1	6 7 7.9	+ 2 14.4	+0 36 44.4	44 55.3	9.494 1832	0.069 8797	0.073 6729
23	58 24 46.9	6 12 10.0	4 54.2	1 21 40.4	44 49.5	9.491 3222	0.077 3508	0.080 9109
24	64 38 57.2	6 15 57.5	7 21.9	2 6 9.2	44 0.6	9.489 2920	0.084 3508	0.087 6685
25	70 56 14.3	6 18 22.3	9 29.5	2 49 27.1	42 27.7	9.488 1366	0.090 8621	0.093 9307
26	77 15 12.6	6 19 19.3	+ 11 10.0	+3 30 50.5	+ 40 12.2	9.487 8820	0.096 8715	0.099 6852
27	83 34 22.6	6 18 45.5	12 17.9	4 9 38.4	37 17.6	9.488 5339	0.102 3708	0.104 9279
28	89 52 13.3	6 16 40.9	12 49.8	4 45 14.4	33 49.2	9.490 0775	0.107 3567	0.109 6575
29	96 7 15.2	6 13 8.8	12 44.9	5 17 7.9	29 53.9	9.492 4787	0.111 8312	0.113 8787
30	102 18 3.6	6 8 15.1	12 4.5	5 44 55.9	25 39.5	9.495 6862	0.115 8012	0.117 6003
31	108 23 20.9	6 2 8.0	+ 10 51.8	+6 8 23.2	+ 21 13.9	9.499 6335	0.119 2777	0.120 8354
Aug. 1	114 21 58.4	5 54 57.3	9 12.1	6 27 22.6	16 44.9	9.504 2443	0.122 2756	0.123 6007
2	120 12 58.2	5 46 54.6	7 11.5	6 41 54.1	12 19.2	9.509 4342	0.124 8132	0.125 9156
3	125 55 34.1	5 38 11.4	4 56.6	6 52 4.1	8 2.9	9.515 1162	0.126 9107	0.127 8011
4	131 29 11.2	5 28 58.9	2 34.0	6 58 4.4	4 0.4	9.521 2025	0.128 5898	0.129 2797
5	136 53 25.8	5 19 28.0	+ 0 9.9	+7 0 10.5	+ 0 15.0	9.527 6079	0.129 8735	0.130 3741
6	142 8 4.3	5 9 48.4	− 2 10.3	6 58 40.7	− 3 11.1	9.534 2517	0.130 7845	0.131 1075
7	147 13 2.5	5 0 8.6	4 22.1	6 53 54.9	6 16.9	9.541 0594	0.131 3458	0.131 5023
8	152 8 23.8	4 50 35.7	6 22.1	6 46 13.5	9 2.2	9.547 9629	0.131 5795	0.131 5801
9	156 54 18.2	4 41 15.6	8 7.6	6 35 56.9	11 27.6	9.554 9018	0.131 5066	0.131 3615
10	161 31 0.8	4 32 12.7	− 9 37.1	+6 23 24.5	− 13 34.0	9.561 8226	0.131 1472	0.130 8659
11	165 58 50.5	4 23 30.3	10 49.6	6 8 54.7	15 22.6	9.568 6790	0.130 5198	0.130 1112
12	170 18 9.2	4 15 11.1	11 44.9	5 52 44.8	16 54.8	9.575 4314	0.129 6420	0.129 1140
13	174 29 20.9	4 7 16.6	12 23.3	5 35 10.2	18 12.2	9.582 0460	0.128 5292	0.127 8892
14	178 32 50.8	3 59 47.5	12 45.4	5 16 24.9	19 16.3	9.588 4949	0.127 1958	0.126 4506
15	182 29 4.6	3 52 44.3	− 12 52.3	+4 56 41.5	− 20 8.6	9.594 7546	0.125 6550	0.124 8104
16	186 18 28.2	3 46 7.0	− 12 45.0	+4 36 11.1	− 20 50.6	9.600 8060	0.123 9181	0.122 9795

MERCURY.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth— At Date.	Logarithm of Distance from Earth— At Intermediate Date.
	° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″			
Aug. 16	186 18 28.2	3 46 7.0	− 12 45.0	+ 4 36 11.1	− 20 50.6	9.600 8060	0.123 9181	0.122 9795
17	190 1 27.2	3 39 55.2	12 24.8	4 15 3.4	21 23.4	9.606 6335	0.121 9956	0.120 9675
18	193 38 26.9	3 34 8.2	11 53.2	3 53 27.0	21 48.2	9.612 2248	0.119 8963	0.118 7830
19	197 9 51.8	3 28 45.5	11 11.4	3 31 29.3	22 6.1	9.617 5703	0.117 6283	0.116 4331
20	200 36 5.7	3 23 46.0	10 20.7	3 9 16.7	22 18.1	9.622 6626	0.115 1983	0.113 9245
21	203 57 31.2	3 19 8.7	− 9 22.6	+ 2 46 54.8	− 22 24.9	9.627 4963	0.112 6123	0.111 2623
22	207 14 30.3	3 14 53.0	8 18.2	2 24 28.4	22 27.1	9.632 0670	0.109 8749	0.108 4507
23	210 27 24.0	3 10 57.6	7 8.8	2 2 1.7	22 25.5	9.636 3722	0.106 9901	0.105 4936
24	213 36 32.1	3 7 21.8	5 55.4	1 39 38.3	22 20.7	9.640 4099	0.103 9614	0.102 3938
25	216 42 13.9	3 4 4.7	4 39.2	1 17 21.1	22 13.1	9.644 1791	0.100 7909	0.099 1530
26	219 44 47.5	3 1 5.4	− 3 21.0	+ 0 55 12.9	− 22 2.9	9.647 6795	0.097 4803	0.095 7728
27	222 44 30.4	2 58 23.1	2 1.8	0 33 16.1	21 50.5	9.650 9112	0.094 0307	0.092 2540
28	225 41 39.2	2 55 57.2	− 0 42.4	+ 0 11 32.5	21 36.3	9.653 8746	0.090 4428	0.088 5970
29	228 36 30.0	2 53 46.9	+ 0 36.5	− 0 9 56.0	21 20.4	9.656 5706	0.086 7164	0.084 8010
30	231 29 18.1	2 51 51.7	1 54.0	0 31 7.9	21 3.1	9.659 0001	0.082 8507	0.080 8653
31	234 20 18.2	2 50 10.9	+ 3 9.6	− 0 52 1.7	− 20 44.3	9.661 1640	0.078 8447	0.076 7886
Sept. 1	237 9 44.6	2 48 44.2	4 22.6	1 12 36.2	20 24.4	9.663 0634	0.074 6968	0.072 5690
2	239 57 51.1	2 47 31.0	5 32.5	1 32 50.5	20 3.5	9.664 6991	0.070 4048	0.068 2040
3	242 44 51.1	2 46 31.1	6 38.7	1 52 43.1	19 41.5	9.666 0722	0.065 9662	0.063 6909
4	245 30 57.7	2 45 44.2	7 40.9	2 12 13.1	19 18.3	9.667 1834	0.061 3778	0.059 0265
5	248 16 23.7	2 45 9.9	+ 8 38.4	− 2 31 19.4	− 18 54.1	9.668 0333	0.056 6365	0.054 2073
6	251 1 21.7	2 44 48.0	9 31.0	2 50 1.0	18 28.9	9.668 6226	0.051 7384	0.049 2294
7	253 46 3.9	2 44 38.4	10 18.3	3 8 16.9	18 2.6	9.668 9517	0.046 6797	0.044 0887
8	256 30 42.8	2 44 41.2	10 59.8	3 26 5.9	17 35.3	9.669 0208	0.041 4559	0.038 7807
9	259 15 30.5	2 44 56.2	11 35.3	3 43 26.9	17 6.7	9.668 8300	0.036 0626	0.033 3009
10	262 0 39.3	2 45 23.4	+ 12 4.3	− 4 0 18.7	− 16 36.7	9.668 3791	0.030 4950	0.027 6444
11	264 46 21.4	2 46 2.7	12 26.8	4 16 39.8	16 5.3	9.667 6679	0.024 7484	0.021 8065
12	267 32 49.1	2 46 54.6	12 42.3	4 32 28.9	15 32.5	9.666 6956	0.018 8181	0.015 7825
13	270 20 14.8	2 47 59.1	12 50.7	4 47 44.3	14 58.0	9.665 4619	0.012 6993	0.009 5679
14	273 8 51.2	2 49 16.2	12 51.8	5 2 24.3	14 21.7	9.663 9660	0.006 3877	0.003 1582
15	275 58 51.2	2 50 46.2	+ 12 45.4	− 5 16 27.0	− 13 43.4	9.662 2070	9.999 8789	9.996 5495
16	278 50 28.1	2 52 29.7	12 31.4	5 29 50.3	13 2.8	9.660 1840	9.993 1694	9.989 7381
17	281 43 55.3	2 54 26.9	12 9.6	5 42 31.8	12 19.7	9.657 8959	9.986 2556	9.982 7217
18	284 39 26.7	2 56 38.2	11 40.0	5 54 28.9	11 34.0	9.655 3417	9.979 1361	9.975 4989
19	287 37 16.7	2 59 4.2	11 2.6	6 5 38.9	10 45.3	9.652 5205	9.971 8100	9.968 0694
20	290 37 40.2	3 1 45.3	+ 10 17.5	− 6 15 58.5	− 9 53.3	9.649 4314	9.964 2774	9.960 4346
21	293 40 52.4	3 4 42.0	9 24.8	6 25 24.3	8 57.7	9.646 0738	9.956 5416	9.952 5992
22	296 47 9.4	3 7 54.9	8 24.7	6 33 52.6	7 58.2	9.642 4475	9.948 6084	9.944 5702
23	299 56 47.8	3 11 24.7	7 17.5	6 41 19.2	6 54.2	9.638 5526	9.940 4861	9.936 3579
24	303 10 4.7	3 15 12.0	6 3.6	6 47 39.4	5 45.4	9.634 3896	9.932 1876	9.927 9778
25	306 27 18.0	3 19 17.7	+ 4 43.5	− 6 52 48.3	− 4 31.4	9.629 9598	9.923 7312	9.919 4507
26	309 48 46.5	3 23 42.4	3 17.8	6 56 40.4	3 11.8	9.625 2655	9.915 1402	9.910 8039
27	313 14 49.4	3 28 26.7	1 47.5	6 59 9.8	1 45.9	9.620 3101	9.906 4465	9.902 0734
28	316 45 46.8	3 33 31.2	+ 0 13.4	7 0 10.1	− 0 13.5	9.615 0983	9.897 6904	9.893 3041
29	320 21 59.4	3 38 56.9	− 1 23.2	6 59 34.3	+ 1 26.1	9.609 6365	9.888 9220	9.884 5525
30	324 3 48.5	3 44 44.4	− 3 1.0	− 6 57 15.3	+ 3 13.3	9.603 9330	9.880 2046	9.875 8883
Oct. 1	327 51 36.0	3 50 54.0	− 4 38.3	− 6 53 5.1	+ 5 8.5	9.597 9988	9.871 6145	9.867 3953

MERCURY.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
							At Date.	At Intermediate Date.
	° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″			
Oct. 1	327 51 36.0	3 50 54.0	− 4 38.3	−6 53 5.1	+ 5 8.5	9.597 9988	9.871 6145	9.867 3953
2	331 45 44.2	3 57 26.0	6 13.2	6 46 55.5	7 12.0	9.591 8477	9.863 2437	9.859 1739
3	335 46 35.6	4 4 20.5	7 43.7	6 38 38.1	9 24.2	9.585 4967	9.855 2009	9.851 3410
4	339 54 32.8	4 11 37.4	9 7.5	6 28 4.2	11 45.1	9.578 9668	9.847 6115	9.844 0309
5	344 9 57.8	4 19 16.2	10 21.9	6 15 5.1	14 14.5	9.572 2836	9.840 6185	9.837 3946
6	348 33 12.2	4 27 16.0	−11 24.4	−5 59 32.5	+16 51.9	9.565 4779	9.834 3800	9.831 5962
7	353 4 36.2	4 35 35.2	12 12.1	5 41 18.7	19 36.8	9.558 5858	9.829 0650	9.826 8085
8	357 44 28.2	4 44 11.6	12 42.2	5 20 16.8	22 28.0	9.551 6502	9.824 8485	9.823 2064
9	2 33 4.2	4 53 2.5	12 52.3	4 56 21.3	25 23.6	9.544 7206	9.821 9025	9.820 9562
10	7 30 36.7	5 2 4.0	12 39.9	4 29 29.0	28 21.2	9.537 8539	9.820 3855	9.820 2064
11	12 37 14.1	5 11 11.3	−12 3.0	−3 59 39.3	+31 17.8	9.531 1138	9.820 4324	9.821 0744
12	17 52 59.3	5 20 18.5	11 1.6	3 26 55.0	34 9.7	9.524 5718	9.822 1403	9.823 6348
13	23 17 48.8	5 29 18.7	9 34.7	2 51 23.0	36 52.4	9.518 3053	9.825 5594	9.827 9122
14	28 51 31.7	5 38 3.8	7 44.2	2 13 15.0	39 20.6	9.512 3974	9.830 6875	9.833 8762
15	34 33 48.2	5 46 24.1	5 32.3	1 32 48.4	41 28.8	9.506 9347	9.837 4657	9.841 4403
16	40 24 8.9	5 54 10.2	− 3 3.8	−0 50 26.0	+43 11.1	9.502 0051	9.845 7813	9.850 4675
17	46 21 54.4	6 1 12.1	− 0 24.3	−0 6 36.6	44 21.8	9.497 6948	9.855 4757	9.860 7808
18	52 26 14.6	6 7 18.1	+ 2 19.3	+0 38 5.5	44 55.7	9.494 0850	9.866 3561	9.872 1741
19	58 36 8.6	6 12 18.1	4 58.8	1 23 1.3	44 48.8	9.491 2477	9.878 2068	9.884 4257
20	64 50 25.8	6 16 3.1	7 26.1	2 7 28.7	43 58.5	9.489 2426	9.890 8028	9.897 3106
21	71 7 47.3	6 18 25.6	+ 9 33.0	+2 50 43.7	+42 24.2	9.488 1138	9.903 9224	9.910 6124
22	77 26 47.5	6 19 19.9	11 12.5	3 32 3.1	40 7.5	9.487 8861	9.917 3562	9.924 1305
23	83 45 56.7	6 18 43.3	12 19.4	4 10 45.8	37 11.7	9.488 5645	9.930 9138	9.937 6859
24	90 3 43.9	6 16 36.1	12 50.2	4 46 15.4	33 42.5	9.490 1340	9.944 4284	9.951 1247
25	96 18 39.8	6 13 1.5	12 44.2	5 18 1.9	29 46.5	9.492 5598	9.957 7597	9.964 3197
26	102 29 19.7	6 8 5.2	+12 2.6	+5 45 42.2	+25 31.7	9.495 7902	9.970 7929	9.977 1687
27	108 34 26.2	6 1 56.2	10 49.2	6 9 1.6	21 5.9	9.499 7584	9.983 4381	9.989 5934
28	114 32 51.2	5 54 44.1	9 8.7	6 27 52.9	16 36.8	9.504 3875	9.995 6280	0.001 5367
29	120 23 37.0	5 46 39.9	7 7.6	6 42 16.4	12 11.3	9.509 5934	0.007 3151	0.012 9599
30	126 5 57.6	5 37 55.6	4 52.3	6 52 18.7	7 55.3	9.515 2887	0.018 4688	0.023 8400
31	131 39 18.5	5 28 42.6	+ 2 29.6	+6 58 11.7	+ 3 53.2	9.521 3859	0.029 0727	0.034 1664
Nov. 1	137 3 16.3	5 19 11.3	+ 0 5.6	7 0 10.9	+ 0 8.4	9.527 7997	0.039 1214	0.043 9384
2	142 17 37.8	5 9 31.4	− 2 14.4	6 58 34.9	− 3 17.0	9.534 4496	0.048 6184	0.053 1630
3	147 22 19.0	4 59 51.7	4 26.0	6 53 43.5	6 22.3	9.541 2612	0.057 5740	0.061 8533
4	152 17 23.5	4 50 19.1	6 25.5	6 45 57.1	9 7.1	9.548 1668	0.066 0031	0.070 0259
5	157 3 1.4	4 40 59.4	− 8 10.6	+6 35 35.9	−11 31.8	9.555 1059	0.073 9241	0.077 7005
6	161 39 28.0	4 31 57.0	9 39.6	6 22 59.6	13 37.6	9.562 0256	0.081 3577	0.084 8983
7	166 7 2.3	4 23 15.3	10 51.5	6 8 26.6	15 25.6	9.568 8797	0.088 3251	0.091 6409
8	170 26 6.3	4 14 56.7	11 46.3	5 52 13.8	16 57.3	9.575 6285	0.094 8485	0.097 9507
9	174 37 4.0	4 7 2.9	12 24.2	5 34 36.8	18 14.3	9.582 2388	0.100 9502	0.103 8497
10	178 40 20.6	3 59 34.6	−12 45.9	+5 15 49.5	−19 18.0	9.588 6826	0.106 6518	0.109 3589
11	182 36 21.8	3 52 32.2	12 52.3	4 56 4.5	20 10.0	9.594 9364	0.111 9737	0.114 4987
12	186 25 33.6	3 45 55.6	12 44.6	4 35 32.8	20 51.7	9.600 9814	0.116 9361	0.119 2883
13	190 8 21.6	3 39 44.6	12 24.0	4 14 24.1	21 24.3	9.606 8021	0.121 5575	0.123 7459
14	193 45 11.0	3 33 58.3	11 52.0	3 52 46.9	21 49.0	9.612 3865	0.125 8555	0.127 8885
15	197 16 26.3	3 28 36.2	−11 9.9	+3 30 48.6	−22 6.7	9.617 7249	0.129 8467	0.131 7320
16	200 42 31.2	3 23 37.3	−10 19.0	+3 8 35.6	−22 18.4	9.622 8097	0.133 5463	0.135 2912

MERCURY.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth— At Date.	Logarithm of Distance from Earth— At Intermediate Date.
	° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″			
Nov. 16	200 42 31.2	3 23 37.3	−10 19.0	+3 8 35.6	−22 18.4	9.622 8097	0.133 5463	0.135 2912
17	204 3 48.5	3 19 0.9	9 20.7	2 46 13.5	22 25.0	9.627 6355	0.136 9684	0.138 5796
18	207 20 40.1	3 14 45.7	8 16.2	2 23 47.1	22 27.2	9.632 1985	0.140 1262	0.141 6097
19	210 33 26.7	3 10 50.9	7 6.6	2 1 20.4	22 25.6	9.636 4958	0.143 0315	0.144 3930
20	213 42 28.4	3 7 15.7	5 53.1	1 38 57.0	22 20.6	9.640 5256	0.145 6954	0.146 9399
21	216 48 4.3	3 3 59.1	− 4 36.7	+1 16 40.1	−22 12.8	9.644 2869	0.148 1278	0.149 2602
22	219 50 32.5	3 1 0.3	3 18.5	0 54 32.3	22 2.6	9.647 7794	0.150 3380	0.151 3622
23	222 50 10.5	2 58 18.5	1 59.3	0 32 35.8	21 50.1	9.651 0031	0.152 3339	0.153 2539
24	225 47 15.0	2 55 53.0	− 0 39.9	+0 10 52.6	21 35.9	9.653 9587	0.154 1231	0.154 9424
25	228 42 1.8	2 53 43.2	+ 0 38.9	−0 10 35.5	21 20.0	9.656 6470	0.155 7124	0.156 4338
26	231 34 46.4	2 51 48.4	+ 1 56.3	−0 31 46.9	−21 2.6	9.659 0686	0.157 1074	0.157 7337
27	234 25 43.5	2 50 8.1	3 11.8	0 52 40.2	20 43.8	9.661 2246	0.158 3134	0.158 8469
28	237 15 7.3	2 48 41.8	4 24.8	1 13 14.2	20 23.9	9.663 1160	0.159 3347	0.159 7774
29	240 3 11.6	2 47 29.0	5 34.6	1 33 27.7	20 2.9	9.664 7438	0.160 1753	0.160 5288
30	242 50 9.8	2 46 29.5	6 40.7	1 53 19.6	19 40.7	9.666 1090	0.160 8382	0.161 1039
Dec. 1	245 36 15.0	2 45 42.9	+ 7 42.7	−2 12 48.8	−19 17.5	9.667 2124	0.161 3261	0.161 5051
2	248 21 39.9	2 45 9.1	8 40.2	2 31 54.4	18 53.4	9.668 0545	0.161 6410	0.161 7340
3	251 6 37.2	2 44 47.6	9 32.6	2 50 35.3	18 28.1	9.668 6360	0.161 7843	0.161 7919
4	253 51 19.2	2 44 38.4	10 19.6	3 8 50.4	18 1.8	9.668 9574	0.161 7569	0.161 6793
5	256 35 58.1	2 44 41.5	11 1.0	3 26 38.5	17 34.3	9.669 0187	0.161 5592	0.161 3965
6	259 20 46.3	2 44 56.8	+11 36.2	−3 43 58.6	−17 5.6	9.668 8200	0.161 1912	0.160 9431
7	262 5 55.9	2 45 24.3	12 5.1	4 0 49.5	16 35.8	9.668 3612	0.160 6521	0.160 3181
8	264 51 39.1	2 46 4.1	12 27.4	4 17 9.7	16 4.4	9.667 6420	0.159 9408	0.159 5200
9	267 38 8.3	2 46 56.3	12 42.7	4 32 57.7	15 31.4	9.666 6620	0.159 0554	0.158 5468
10	270 25 36.0	2 48 1.0	12 50.9	4 48 12.0	14 56.8	9.665 4204	0.157 9938	0.157 3960
11	273 14 14.7	2 49 18.6	+12 51.8	−5 2 50.9	−14 20.5	9.663 9164	0.156 7531	0.156 0645
12	276 4 17.5	2 50 49.2	12 45.1	5 16 52.4	13 42.2	9.662 1493	0.155 3298	0.154 5485
13	278 55 57.5	2 52 33.1	12 30.8	5 30 14.4	13 1.4	9.660 1182	0.153 7200	0.152 8438
14	281 49 28.2	2 54 30.7	12 8.8	5 42 54.5	12 18.3	9.657 8220	0.151 9193	0.150 9456
15	284 45 3.6	2 56 42.4	11 39.0	5 54 50.2	11 32.6	9.655 2596	0.149 9220	0.148 8479
16	287 42 58.0	2 59 8.9	+11 1.4	−6 5 58.7	−10 43.8	9.652 4302	0.147 7224	0.146 5447
17	290 43 26.4	3 1 50.4	10 16.0	6 16 16.7	9 51.7	9.649 3330	0.145 3139	0.144 0290
18	293 46 44.0	3 4 47.5	9 23.1	6 25 40.9	8 56.0	9.645 9673	0.142 6891	0.141 2931
19	296 53 6.8	3 8 0.9	8 22.8	6 34 7.4	7 56.2	9.642 3328	0.139 8398	0.138 3281
20	300 2 51.5	3 11 31.4	7 15.3	6 41 31.9	6 52.1	9.638 4295	0.136 7569	0.135 1249
21	303 16 15.4	3 15 19.3	+ 6 1.2	−6 47 50.0	− 5 43.2	9.634 2582	0.133 4308	0.131 6731
22	306 33 36.3	3 19 25.5	4 40.9	6 52 56.6	4 29.0	9.629 8203	0.129 8503	0.127 9611
23	309 55 12.8	3 23 50.7	3 15.1	6 56 46.2	3 9.2	9.625 1179	0.126 0039	0.123 9770
24	313 21 24.4	3 28 35.7	1 44.6	6 59 13.0	1 43.2	9.620 1545	0.121 8787	0.119 7072
25	316 52 31.0	3 33 41.1	+ 0 10.4	7 0 10.5	− 0 10.5	9.614 9349	0.117 4608	0.115 1374
26	320 28 53.5	3 39 7.5	− 1 26.2	−6 59 31.7	+ 1 29.3	9.609 4655	0.112 7351	0.110 2518
27	324 10 53.3	3 44 55.6	3 4.0	6 57 9.3	3 16.7	9.603 7547	0.107 6855	0.105 0339
28	327 58 52.2	3 51 5.8	4 41.2	6 52 55.6	5 12.2	9.597 8135	0.102 2947	0.099 4657
29	331 53 12.4	3 57 38.4	6 16.1	6 46 42.2	7 16.0	9.591 6559	0.096 5445	0.093 5286
30	335 54 16.5	4 4 33.6	7 46.4	6 38 20.7	9 28.4	9.585 2990	0.090 4155	0.087 2028
31	340 2 27.0	4 11 51.2	− 9 9.9	−6 27 42.5	+11 49.5	9.578 7639	0.083 8878	0.080 4679
32	344 18 6.1	4 19 30.7	−10 24.0	−6 14 38.9	+14 19.1	9.572 0764	0.076 9403	0.073 3023

VENUS.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth— At Date.	Logarithm of Distance from Earth— At Intermediate Date.
	° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″			
Jan. 1	211 31 7.5	1 36 20.4	−3 1.0	+2 22 24.4	−4 4.7	9.858 8503	0.150 3512	0.151 8487
3	214 43 42.7	1 36 14.9	2 59.4	2 14 2.0	4 17.5	9.859 0148	0.153 3308	0.154 7977
5	217 56 7.1	1 36 9.4	2 55.5	2 5 14.8	4 29.5	9.859 1801	0.156 2493	0.157 6859
7	221 8 20.4	1 36 3.9	2 49.5	1 56 4.5	4 40.6	9.859 3457	0.159 1075	0.160 5142
9	224 20 22.7	1 35 58.5	2 41.4	1 46 33.0	4 50.8	9.859 5113	0.161 9060	0.163 2830
11	227 32 14.2	1 35 53.1	−2 31.3	+1 36 42.0	−5 0.1	9.859 6761	0.164 6454	0.165 9931
13	230 43 55.2	1 35 47.8	2 19.3	1 26 33.4	5 8.4	9.859 8397	0.167 3263	0.168 6449
15	233 55 25.8	1 35 42.7	2 5.5	1 16 9.1	5 15.7	9.860 0016	0.169 9490	0.171 2386
17	237 6 46.4	1 35 37.8	1 50.3	1 5 31.1	5 22.0	9.860 1613	0.172 5138	0.173 7747
19	240 17 57.2	1 35 33.1	1 33.6	0 54 41.4	5 27.4	9.860 3184	0.175 0213	0.176 2537
21	243 28 58.7	1 35 28.5	−1 15.9	+0 43 42.1	−5 31.8	9.860 4722	0.177 4720	0.178 6763
23	246 39 51.2	1 35 24.1	0 57.2	0 32 35.2	5 35.0	9.860 6224	0.179 8667	0.181 0434
25	249 50 35.2	1 35 19.9	0 37.8	0 21 22.7	5 37.2	9.860 7685	0.182 2066	0.183 3564
27	253 1 11.1	1 35 16.0	−0 17.9	+0 10 6.7	5 38.5	9.860 9100	0.184 4930	0.185 6166
29	256 11 39.5	1 35 12.4	+0 2.1	−0 1 10.8	5 38.7	9.861 0466	0.186 7275	0.187 8257
31	259 22 0.9	1 35 9.0	+0 22.1	−0 12 27.6	−5 37.9	9.861 1778	0.188 9113	0.189 9845
Feb. 2	262 32 15.8	1 35 5.9	0 41.8	0 23 41.7	5 36.0	9.861 3032	0.191 0454	0.192 0941
4	265 42 24.8	1 35 3.1	1 1.0	0 34 51.1	5 33.2	9.861 4225	0.193 1307	0.194 1552
6	268 52 28.4	1 35 0.6	1 19.5	0 45 53.8	5 29.3	9.861 5352	0.195 1676	0.196 1679
8	272 2 27.3	1 34 58.4	1 36.9	0 56 47.7	5 24.4	9.861 6411	0.197 1562	0.198 1325
10	275 12 22.0	1 34 56.5	+1 53.2	−1 7 30.9	−5 18.5	9.861 7398	0.199 0968	0.200 0491
12	278 22 13.1	1 34 54.8	2 8.1	1 18 1.4	5 11.8	9.861 8311	0.200 9895	0.201 9179
14	281 32 1.1	1 34 53.4	2 21.4	1 28 17.5	5 4.1	9.861 9146	0.202 8342	0.203 7385
16	284 41 46.8	1 34 52.3	2 33.0	1 38 17.2	4 55.4	9.861 9901	0.204 6308	0.205 5111
18	287 51 30.5	1 34 51.5	2 42.7	1 47 58.7	4 45.9	9.862 0575	0.206 3792	0.207 2351
20	291 1 12.9	1 34 51.0	+2 50.5	−1 57 20.3	−4 35.6	9.862 1164	0.208 0790	0.208 9109
22	294 10 54.5	1 34 50.7	2 56.2	2 6 20.4	4 24.4	9.862 1668	0.209 7309	0.210 5390
24	297 20 35.9	1 34 50.7	2 59.7	2 14 57.4	4 12.4	9.862 2085	0.211 3354	0.212 1202
26	300 30 17.5	1 34 50.9	3 1.0	2 23 9.7	3 59.7	9.862 2414	0.212 8935	0.213 6555
28	303 39 59.9	1 34 51.4	3 0.1	2 30 55.8	3 46.2	9.862 2653	0.214 4061	0.215 1455
Mar. 2	306 49 43.4	1 34 52.1	+2 57.0	−2 38 14.3	−3 32.1	9.862 2802	0.215 8737	0.216 5909
4	309 59 28.4	1 34 53.0	2 51.8	2 45 3.9	3 17.4	9.862 2860	0.217 2969	0.217 9918
6	313 9 15.5	1 34 54.2	2 44.5	2 51 23.4	3 2.0	9.862 2828	0.218 6757	0.219 3485
8	316 19 5.1	1 34 55.4	2 35.2	2 57 11.6	2 46.1	9.862 2706	0.220 0102	0.220 6609
10	319 28 57.4	1 34 56.9	2 24.0	3 2 27.4	2 29.7	9.862 2493	0.221 3004	0.221 9288
12	322 38 52.8	1 34 58.5	+2 11.1	−3 7 10.0	−2 12.9	9.862 2190	0.222 5460	0.223 1519
14	325 48 51.7	1 35 0.3	1 56.5	3 11 18.4	1 55.5	9.862 1799	0.223 7464	0.224 3295
16	328 58 54.3	1 35 2.3	1 40.5	3 14 51.9	1 37.8	9.862 1321	0.224 9012	0.225 4613
18	332 9 0.8	1 35 4.3	1 23.3	3 17 49.8	1 19.9	9.862 0757	0.226 0096	0.226 5461
20	335 19 11.5	1 35 6.5	1 5.1	3 20 11.4	1 1.7	9.862 0108	0.227 0708	0.227 5836
22	338 29 26.6	1 35 8.7	+0 46.0	−3 21 56.4	−0 43.2	9.861 9376	0.228 0845	0.228 5734
24	341 39 46.4	1 35 11.1	0 26.4	3 23 4.5	0 24.7	9.861 8565	0.229 0505	0.229 5156
26	344 50 11.0	1 35 13.5	+0 6.5	3 23 35.3	−0 6.0	9.861 7674	0.229 9690	0.230 4106
28	348 0 40.5	1 35 16.0	−0 13.5	3 23 28.7	+0 12.7	9.861 6711	0.230 8404	0.231 2585
30	351 11 15.1	1 35 18.6	0 33.4	3 22 44.7	0 31.4	9.861 5674	0.231 6649	0.232 0596
Apr. 1	354 21 55.0	1 35 21.3	−0 52.9	−3 21 23.3	+0 50.0	9.861 4567	0.232 4427	0.232 8141

VENUS.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
							At Date.	At Intermediate Date.
	° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″			
Apr. 1	354 21 55.0	1 35 21.3	−0 52.9	−3 21 23.3	+0 50.0	9.861 4567	0.232 4427	0.232 8141
3	357 32 40.2	1 35 24.0	1 11.7	3 19 24.8	1 8.5	9.861 3394	0.233 1739	0.233 5220
5	0 43 30.9	1 35 26.7	1 29.7	3 16 49.5	1 26.8	9.861 2160	0.233 8583	0.234 1828
7	3 54 27.2	1 35 29.5	1 46.6	3 13 37.8	1 44.9	9.861 0866	0.234 4955	0.234 7963
9	7 5 29.1	1 35 32.4	2 2.1	3 9 50.1	2 2.7	9.860 9517	0.235 0852	0.235 3620
11	10 16 36.8	1 35 35.3	−2 16.2	−3 5 27.2	+2 20.1	9.860 8118	0.235 6266	0.235 8790
13	13 27 50.3	1 35 38.2	2 28.6	3 0 29.8	2 37.2	9.860 6672	0.236 1189	0.236 3463
15	16 39 9.7	1 35 41.2	2 39.1	2 54 58.7	2 53.8	9.860 5184	0.236 5612	0.236 7633
17	19 50 35.1	1 35 44.2	2 47.7	2 48 54.9	3 10.0	9.860 3658	0.236 9525	0.237 1287
19	23 2 6.6	1 35 47.3	2 54.3	2 42 19.4	3 25.5	9.860 2099	0.237 2917	0.237 4415
21	26 13 44.3	1 35 50.4	−2 58.6	−2 35 13.4	+3 40.4	9.860 0512	0.237 5780	0.237 7012
23	29 25 28.2	1 35 53.5	3 0.8	2 27 38.2	3 54.7	9.859 8901	0.237 8111	0.237 9077
25	32 37 18.4	1 35 56.7	3 0.7	2 19 35.2	4 8.3	9.859 7272	0.237 9910	0.238 0610
27	35 49 15.1	1 36 0.0	2 58.3	2 11 5.7	4 21.1	9.859 5630	0.238 1177	0.238 1611
29	39 1 18.3	1 36 3.3	2 53.8	2 2 11.3	4 33.2	9.859 3979	0.238 1911	0.238 2078
May 1	42 13 28.1	1 36 6.6	−2 47.0	−1 52 53.6	+4 44.4	9.859 2325	0.238 2112	0.238 2012
3	45 25 44.5	1 36 9.9	2 38.2	1 43 14.4	4 54.7	9.859 0673	0.238 1778	0.238 1410
5	48 38 7.8	1 36 13.3	2 27.4	1 33 15.3	5 4.2	9.858 9029	0.238 0906	0.238 0267
7	51 50 38.0	1 36 16.8	2 14.7	1 22 58.2	5 12.7	9.858 7396	0.237 9492	0.237 8581
9	55 3 15.0	1 36 20.3	2 0.3	1 12 25.1	5 20.2	9.858 5781	0.237 7532	0.237 6346
11	58 15 59.1	1 36 23.8	−1 44.4	−1 1 37.9	+5 26.8	9.858 4189	0.237 5020	0.237 3554
13	61 28 50.3	1 36 27.4	1 27.2	0 50 38.5	5 32.4	9.858 2624	0.237 1947	0.237 0195
15	64 41 48.7	1 36 31.0	1 8.8	0 39 29.1	5 36.9	9.858 1092	0.236 8298	0.236 6254
17	67 54 54.2	1 36 34.6	0 49.6	0 28 11.8	5 40.3	9.857 9598	0.236 4062	0.236 1721
19	71 8 7.0	1 36 38.2	0 29.8	0 16 48.7	5 42.6	9.857 8145	0.235 9230	0.235 6588
21	74 21 27.0	1 36 41.8	−0 9.5	−0 5 22.0	+5 43.9	9.857 6740	0.235 3796	0.235 0852
23	77 34 54.4	1 36 45.5	+0 10.9	+0 6 6.3	5 44.1	9.857 5387	0.234 7757	0.234 4510
25	80 48 28.9	1 36 49.1	0 31.1	0 17 33.8	5 43.2	9.857 4089	0.234 1110	0.233 7558
27	84 2 10.6	1 36 52.6	0 51.0	0 28 58.3	5 41.2	9.857 2851	0.233 3854	0.232 9999
29	87 15 59.4	1 36 56.2	1 10.2	0 40 17.7	5 38.0	9.857 1678	0.232 5992	0.232 1834
31	90 29 55.2	1 36 59.6	+1 28.6	+0 51 29.7	+5 33.8	9.857 0572	0.231 7524	0.231 3063
June 2	93 43 57.9	1 37 3.0	1 45.8	1 2 32.3	5 28.5	9.856 9538	0.230 8450	0.230 3685
4	96 58 7.2	1 37 6.3	2 1.7	1 13 23.2	5 22.2	9.856 8579	0.229 8767	0.229 3697
6	100 12 23.1	1 37 9.5	2 16.0	1 24 0.3	5 14.8	9.856 7699	0.228 8475	0.228 3100
8	103 26 45.2	1 37 12.6	2 28.6	1 34 21.6	5 6.3	9.856 6899	0.227 7570	0.227 1886
10	106 41 13.2	1 37 15.5	+2 39.4	+1 44 25.1	+4 56.8	9.856 6183	0.226 6045	0.226 0047
12	109 55 47.0	1 37 18.2	2 48.1	1 54 8.6	4 46.5	9.856 5553	0.225 3891	0.224 7575
14	113 10 26.0	1 37 20.8	2 54.6	2 3 30.3	4 35.1	9.856 5012	0.224 1099	0.223 4460
16	116 25 9.9	1 37 23.1	2 58.9	2 12 28.4	4 22.8	9.856 4560	0.222 7659	0.222 0694
18	119 39 58.4	1 37 25.2	3 0.9	2 21 1.2	4 9.8	9.856 4200	0.221 3564	0.220 6269
20	122 54 50.8	1 37 27.2	+3 0.5	+2 29 6.9	+3 55.8	9.856 3932	0.219 8809	0.219 1184
22	126 9 46.8	1 37 28.8	2 57.9	2 36 43.9	3 41.0	9.856 3758	0.218 3394	0.217 5439
24	129 24 45.7	1 37 30.1	2 53.0	2 43 50.8	3 25.7	9.856 3679	0.216 7318	0.215 9032
26	132 39 47.1	1 37 31.2	2 45.8	2 50 26.2	3 9.5	9.856 3693	0.215 0581	0.214 1965
28	135 54 50.2	1 37 31.9	2 36.6	2 56 28.6	2 52.8	9.856 3802	0.213 3184	0.212 4239
30	139 9 54.5	1 37 32.4	+2 25.3	+3 1 57.0	+2 35.5	9.856 4005	0.211 5131	0.210 5860
July 2	142 24 59.3	1 37 32.4	+2 12.1	+3 6 50.3	+2 17.7	9.856 4302	0.209 6425	0.208 6828

VENUS.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
							At Date.	At Intermediate Date.
	° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″			
July 2	142 24 59.3	1 37 32.4	+2 12.1	+3 6 50.3	+2 17.7	9.856 4302	0.209 6425	0.208 6828
4	145 40 3.9	1 37 32.2	1 57.2	3 11 7.5	1 59.4	9.856 4691	0.207 7069	0.206 7148
6	148 55 7.8	1 37 31.6	1 40.9	3 14 47.8	1 40.8	9.856 5171	0.205 7065	0.204 6819
8	152 10 10.1	1 37 30.6	1 23.2	3 17 50.6	1 21.9	9.856 5741	0.203 6410	0.202 5837
10	155 25 10.2	1 37 29.3	1 4.5	3 20 15.2	1 2.7	9.856 6398	0.201 5098	0.200 4192
12	158 40 7.3	1 37 27.7	+0 45.0	+3 22 1.2	+0 43.3	9.856 7140	0.199 3119	0.198 1878
14	161 55 0.8	1 37 25.7	0 24.8	3 23 8.3	0 23.7	9.856 7966	0.197 0468	0.195 8887
16	165 9 49.9	1 37 23.3	+0 4.4	3 23 36.4	+0 4.2	9.856 8873	0.194 7136	0.193 5213
18	168 24 34.1	1 37 20.7	−0 16.0	3 23 25.3	−0 15.3	9.856 9856	0.192 3117	0.191 0849
20	171 39 12.5	1 37 17.7	0 36.3	3 22 35.2	0 34.7	9.857 0914	0.189 8408	0.188 5794
22	174 53 44.5	1 37 14.3	−0 56.1	+3 21 6.3	−0 54.0	9.857 2043	0.187 3007	0.186 0048
24	178 8 9.6	1 37 10.7	1 15.1	3 18 58.9	1 13.1	9.857 3238	0.184 6916	0.183 3612
26	181 22 27.2	1 37 6.8	1 33.2	3 16 13.5	1 32.1	9.857 4496	0.182 0136	0.180 6487
28	184 36 36.6	1 37 2.6	1 50.1	3 12 50.8	1 50.6	9.857 5814	0.179 2666	0.177 8675
30	187 50 37.4	1 36 58.2	2 5.6	3 8 51.4	2 8.7	9.857 7186	0.176 4515	0.175 0185
Aug. 1	191 4 29.1	1 36 53.5	−2 19.4	+3 4 16.2	−2 26.4	9.857 8608	0.173 5685	0.172 1015
3	194 18 11.4	1 36 48.7	2 31.5	2 59 6.2	2 43.6	9.858 0076	0.170 6176	0.169 1168
5	197 31 43.8	1 36 43.7	2 41.7	2 53 22.3	3 0.2	9.858 1585	0.167 5992	0.166 0648
7	200 45 5.9	1 36 38.5	2 49.8	2 47 5.8	3 16.2	9.858 3130	0.164 5136	0.162 9454
9	203 58 17.6	1 36 33.2	2 55.8	2 40 18.0	3 31.5	9.858 4706	0.161 3599	0.159 7569
11	207 11 18.6	1 36 27.8	−2 59.5	+2 33 0.2	−3 46.2	9.858 6308	0.158 1363	0.156 4980
13	210 24 8.7	1 36 22.3	3 1.0	2 25 13.8	4 0.1	9.858 7931	0.154 8419	0.153 1680
15	213 36 47.8	1 36 16.8	3 0.2	2 17 0.5	4 13.1	9.858 9570	0.151 4761	0.149 7662
17	216 49 16.0	1 36 11.3	2 57.2	2 8 21.8	4 25.4	9.859 1219	0.148 0383	0.146 2922
19	220 1 33.1	1 36 5.8	2 51.9	1 59 19.4	4 36.8	9.859 2874	0.144 5277	0.142 7449
21	223 13 39.3	1 36 0.4	−2 44.5	+1 49 55.1	−4 47.3	9.859 4529	0.140 9436	0.139 1240
23	226 25 34.6	1 35 55.0	2 35.0	1 40 10.6	4 56.9	9.859 6179	0.137 2859	0.135 4293
25	229 37 19.3	1 35 49.7	2 23.7	1 30 7.9	5 5.5	9.859 7819	0.133 5543	0.131 6608
27	232 48 53.6	1 35 44.6	2 10.5	1 19 48.9	5 13.2	9.859 9444	0.129 7488	0.127 8184
29	236 0 17.7	1 35 39.6	1 55.8	1 9 15.5	5 19.9	9.860 1048	0.125 8696	0.123 9024
31	239 11 31.9	1 35 34.7	−1 39.6	+0 58 29.7	−5 25.6	9.860 2628	0.121 9167	0.119 9126
Sept. 2	242 22 36.7	1 35 30.1	1 22.2	0 47 33.5	5 30.3	9.860 4177	0.117 8901	0.115 8490
4	245 33 32.3	1 35 25.6	1 3.8	0 36 29.0	5 34.0	9.860 5691	0.113 7894	0.111 7111
6	248 44 19.3	1 35 21.4	0 44.6	0 25 18.2	5 36.6	9.860 7166	0.109 6138	0.107 4973
8	251 54 58.1	1 35 17.4	0 24.9	0 14 3.2	5 38.2	9.860 8597	0.105 3616	0.103 2064
10	255 5 29.1	1 35 13.7	−0 4.9	+0 2 46.0	−5 38.7	9.860 9980	0.101 0314	0.098 8364
12	258 15 52.9	1 35 10.2	+0 15.1	−0 8 31.3	5 38.3	9.861 1310	0.096 6212	0.094 3857
14	261 26 10.1	1 35 7.0	0 35.0	0 19 46.6	5 36.8	9.861 2584	0.092 1296	0.089 8528
16	264 36 21.2	1 35 4.1	0 54.4	0 30 57.9	5 34.3	9.861 3798	0.087 5550	0.085 2361
18	267 46 26.7	1 35 1.5	1 13.1	0 42 3.1	5 30.8	9.861 4947	0.082 8958	0.080 5341
20	270 56 27.2	1 34 59.1	+1 31.0	−0 53 0.3	−5 26.3	9.861 6029	0.078 1507	0.075 7455
22	274 6 23.4	1 34 57.1	1 47.7	1 3 47.5	5 20.7	9.861 7041	0.073 3184	0.070 8692
24	277 16 15.8	1 34 55.4	2 3.1	1 14 22.7	5 14.2	9.861 7978	0.068 3977	0.065 9039
26	280 26 4.9	1 34 53.9	2 17.0	1 24 44.0	5 6.8	9.861 8840	0.063 3877	0.060 8491
28	283 35 51.5	1 34 52.7	2 29.2	1 34 49.6	4 58.6	9.861 9622	0.058 2880	0.055 7043
30	286 45 35.9	1 34 51.8	+2 39.6	−1 44 37.8	−4 49.4	9.862 0323	0.053 0979	0.050 4686
Oct. 2	289 55 18.8	1 34 51.2	+2 48.0	−1 54 6.6	−4 39.3	9.862 0941	0.047 8163	0.045 1408

VENUS.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
							At Date.	At Intermediate Date.
	° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″			
Oct. 2	289 55 18.8	1 34 51.2	+2 48.0	−1 54 6.6	−4 39.3	9.862 0941	0.047 8163	0.045 1408
4	293 5 0.8	1 34 50.8	2 54.4	2 3 14.4	4 28.4	9.862 1474	0.042 4419	0.039 7189
6	296 14 42.3	1 34 50.7	2 58.7	2 11 59.7	4 16.7	9.862 1920	0.036 9719	0.034 2005
8	299 24 23.9	1 34 50.9	3 0.8	2 20 20.8	4 4.2	9.862 2278	0.031 4042	0.028 5827
10	302 34 6.0	1 34 51.3	3 0.7	2 28 16.2	3 51.0	9.862 2547	0.025 7356	0.022 8626
12	305 43 49.2	1 34 51.9	+2 58.4	−2 35 44.4	−3 37.1	9.862 2726	0.019 9634	0.017 0373
14	308 53 33.8	1 34 52.8	2 53.9	2 42 44.2	3 22.5	9.862 2814	0.014 0842	0.011 1036
16	312 3 20.3	1 34 53.8	2 47.3	2 49 14.3	3 7.4	9.862 2812	0.008 0951	0.005 0583
18	315 13 9.2	1 34 55.0	2 38.7	2 55 13.6	2 51.7	9.862 2720	0.001 9929	9.998 8985
20	318 23 0.6	1 34 56.5	2 28.2	3 0 40.9	2 35.5	9.862 2537	9.995 7747	9.992 6213
22	321 32 55.1	1 34 5[illegible].0	+2 15.8	−3 5 35.2	−2 18.7	9.862 2264	9.989 4378	9.986 2239
24	324 42 52.9	1 34 59.8	2 1.8	3 9 55.6	2 1.6	9.862 1902	9.982 9793	9.979 7038
26	327 52 54.3	1 35 1.7	1 46.3	3 13 41.4	1 44.1	9.862 1452	9.976 3973	9.973 0594
28	331 2 59.6	1 35 3.7	1 29.4	3 16 51.8	1 26.2	9.862 0916	9.969 6898	9.966 2882
30	334 13 9.1	1 35 5.8	1 11.5	3 19 26.2	1 8.1	9.862 0296	9.962 8544	9.959 3881
Nov. 1	337 23 22.9	1 35 8.0	+0 52.7	−3 21 24.0	−0 49.7	9.861 9591	9.955 8888	9.952 3561
3	340 33 41.2	1 35 10.4	0 33.3	3 22 45.0	0 31.2	9.861 8806	9.948 7897	9.945 1888
5	343 44 4.3	1 35 12.8	+0 13.5	3 23 28.8	−0 12.6	9.861 7942	9.941 5528	9.937 8812
7	346 54 32.4	1 35 15.3	−0 6.6	3 23 35.3	+0 6.1	9.861 7001	9.934 1734	9.930 4289
9	350 5 5.5	1 35 17.9	0 26.5	3 23 4.4	0 24.8	9.861 5987	9.926 6468	9.922 8267
11	353 15 43.8	1 35 20.5	−0 46.2	−3 21 56.1	+0 43.5	9.861 4903	9.918 9678	9.915 0695
13	356 26 27.4	1 35 23.1	1 5.2	3 20 10.5	1 2.0	9.861 3752	9.911 1310	9.907 1517
15	359 37 16.4	1 35 25.9	1 23.5	3 17 48.0	1 20.4	9.861 2538	9.903 1310	9.899 0681
17	2 48 11.0	1 35 28.7	1 40.8	3 14 48.9	1 38.6	9.861 1263	9.894 9625	9.890 8134
19	5 59 11.2	1 35 31.6	1 56.8	3 11 13.7	1 56.5	9.860 9932	9.886 6202	9.882 3824
21	9 10 17.2	1 35 34.5	−2 11.4	−3 7 3.0	+2 14.1	9.860 8549	9.878 0994	9.873 7706
23	12 21 29.0	1 35 37.4	2 24.4	3 2 17.5	2 31.3	9.860 7118	9.869 3954	9.864 9734
25	15 32 46.6	1 35 40.3	2 35.7	2 56 58.0	2 48.1	9.860 5644	9.860 5043	9.855 9876
27	18 44 10.2	1 35 43.3	2 45.0	2 51 5.5	3 4.3	9.860 4130	9.851 4228	9.846 8094
29	21 55 39.9	1 35 46.3	2 52.2	2 44 41.0	3 20.1	9.860 2582	9.842 1469	9.837 4348
Dec. 1	25 7 15.7	1 35 49.4	−2 57.4	−2 37 45.5	+3 35.3	9.860 1003	9.832 6723	9.827 8588
3	28 18 57.8	1 35 52.6	3 0.3	2 30 20.3	3 49.8	9.859 9401	9.822 9934	9.818 0758
5	31 30 46.2	1 35 55.7	3 1.0	2 22 26.8	4 3.6	9.859 7778	9.813 1047	9.808 0797
7	34 42 40.9	1 35 59.0	2 59.4	2 14 6.3	4 16.7	9.859 6140	9.802 9999	9.797 8646
9	37 54 42.2	1 36 2.4	2 55.6	2 5 20.4	4 29.0	9.859 4492	9.792 6730	9.787 4243
11	41 6 50.0	1 36 5.6	−2 49.6	−1 56 10.7	+4 40.5	9.859 2839	9.782 1177	9.776 7524
13	44 19 4.4	1 36 8.9	2 41.5	1 46 38.7	4 51.2	9.859 1187	9.771 3277	9.765 8430
15	47 31 25.6	1 36 12.3	2 31.3	1 36 46.3	5 1.0	9.858 9541	9.760 2978	9.754 6909
17	50 43 53.6	1 36 15.7	2 19.3	1 26 35.3	5 9.8	9.858 7905	9.749 0221	9.743 2910
19	53 56 28.6	1 36 19.2	2 5.5	1 16 7.5	5 17.7	9.858 6285	9.737 4976	9.731 6419
21	57 9 10.6	1 36 22.7	−1 50.1	−1 5 24.9	+5 24.6	9.858 4686	9.725 7237	9.719 7428
23	60 21 59.6	1 36 26.3	1 33.3	0 54 29.5	5 30.5	9.858 3113	9.713 6997	9.707 5949
25	63 34 55.7	1 36 29.9	1 15.3	0 43 23.4	5 35.4	9.858 1571	9.701 4291	9.695 2029
27	66 47 59.0	1 36 33.5	0 56.4	0 32 8.6	5 39.2	9.858 0065	9.688 9174	9.682 5732
29	70 1 9.6	1 36 37.1	0 36.7	0 20 47.2	5 42.0	9.857 8600	9.676 1718	9.669 7142
31	73 14 27.4	1 36 40.7	−0 16.6	−0 9 21.5	+5 43.6	9.857 7181	9.663 2018	9.656 6363
33	76 27 52.0	1 36 44.3	+0 3.6	+0 2 6.2	+5 44.1	9.857 5813	9.650 0179	. . . . .

MARS.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
							At Date.	At Intermediate Date.
	° ′ ″	′ ″	″	° ′ ″	′ ″			
Jan. 1	207 55 32.3	28 24.42	− 35.9	+ 0 39 39.6	− 0 51.42	0.203 9205	0.325 0242	0.323 4343
3	208 52 25.6	28 28.92	34.6	0 37 56.3	0 51.87	0.203 3460	0.321 8318	0.320 2171
5	209 49 28.0	28 33.50	33.2	0 36 12.1	0 52.32	0.202 7639	0.318 5900	0.316 9505
7	210 46 39.6	28 38.15	31.8	0 34 27.0	0 52.75	0.202 1743	0.315 2986	0.313 6342
9	211 44 0.6	28 42.86	30.3	0 32 41.1	0 53.18	0.201 5773	0.311 9571	0.310 2674
11	212 41 31.0	28 47.63	− 28.8	+ 0 30 54.3	− 0 53.60	0.200 9730	0.308 5650	0.306 8499
13	213 39 11.1	28 52.48	27.2	0 29 6.7	0 53.98	0.200 3615	0.305 1221	0.303 3815
15	214 37 1.0	28 57.40	25.7	0 27 18.4	0 54.35	0.199 7430	0.301 6280	0.299 8618
17	215 35 0.8	29 2.39	24.0	0 25 29.2	0 54.73	0.199 1176	0.298 0829	0.296 2911
19	216 33 10.6	29 7.46	22.4	0 23 39.2	0 55.10	0.198 4855	0.294 4862	0.292 6681
21	217 31 30.7	29 12.60	− 20.7	+ 0 21 48.5	− 0 55.47	0.197 8467	0.290 8369	0.288 9931
23	218 30 1.1	29 17.80	19.0	0 19 57.2	0 55.82	0.197 2014	0.287 1367	0.285 2676
25	219 28 41.9	29 23.07	17.3	0 18 5.1	0 56.18	0.196 5497	0.283 3859	0.281 4917
27	220 27 33.3	29 28.42	15.5	0 16 12.4	0 56.50	0.195 8919	0.279 5851	0.277 6663
29	221 26 35.5	29 33.84	13.8	0 14 19.1	0 56.80	0.195 2280	0.275 7352	0.273 7919
31	222 25 48.6	29 39.33	− 12.0	+ 0 12 25.1	− 0 57.10	0.194 5582	0.271 8365	0.269 8690
Feb. 2	223 25 12.7	29 44.86	10.1	0 10 30.6	0 57.37	0.193 8826	0.267 8894	0.265 8976
4	224 24 48.0	29 50.43	8.3	0 8 35.6	0 57.65	0.193 2015	0.263 8935	0.261 8773
6	225 24 34.5	29 56.08	6.5	0 6 40.1	0 57.90	0.192 5150	0.259 8488	0.257 8080
8	226 24 32.4	30 1.80	4.6	0 4 44.0	0 58.15	0.191 8233	0.255 7548	0.253 6894
10	227 24 41.8	30 7.59	− 2.7	+ 0 2 47.4	− 0 58.39	0.191 1264	0.251 6116	0.249 5215
12	228 25 2.8	30 13.44	− 0.8	+ 0 0 50.4	0 58.60	0.190 4247	0.247 4189	0.245 3038
14	229 25 35.6	30 19.36	+ 1.1	− 0 1 6.9	0 58.77	0.189 7183	0.243 1756	0.241 0350
16	230 26 20.3	30 25.34	3.0	0 3 4.6	0 58.92	0.189 0073	0.238 8818	0.236 7160
18	231 27 17.0	30 31.36	4.9	0 5 2.7	0 59.06	0.188 2921	0.234 5377	0.232 3469
20	232 28 25.8	30 37.44	+ 6.8	− 0 7 1.0	− 0 59.20	0.187 5727	0.230 1435	0.227 9276
22	233 29 46.8	30 43.56	8.7	0 8 59.6	0 59.33	0.186 8494	0.225 6995	0.223 4594
24	234 31 20.1	30 49.73	10.6	0 10 58.4	0 59.45	0.186 1224	0.221 2074	0.218 9434
26	235 33 5.8	30 55.96	12.5	0 12 57.4	0 59.55	0.185 3919	0.216 6675	0.214 3799
28	236 35 4.0	31 2.26	14.3	0 14 56.6	0 59.63	0.184 6580	0.212 0807	0.209 7697
Mar. 2	237 37 14.9	31 8.62	+ 16.2	− 0 16 55.9	− 0 59.66	0.183 9211	0.207 4471	0.205 1131
4	238 39 38.6	31 15.02	18.1	0 18 55.2	0 59.65	0.183 1813	0.202 7675	0.200 4101
6	239 42 15.0	31 21.46	19.9	0 20 54.5	0 59.65	0.182 4389	0.198 0410	0.195 6602
8	240 45 4.3	31 27.94	21.7	0 22 53.9	0 59.64	0.181 6941	0.193 2676	0.190 8633
10	241 48 6.7	31 34.46	23.5	0 24 53.3	0 59.62	0.180 9472	0.188 4472	0.186 0192
12	242 51 22.1	31 41.01	+ 25.3	− 0 26 52.5	− 0 59.56	0.180 1983	0.183 5791	0.181 1270
14	243 54 50.7	31 47.60	27.0	0 28 51.6	0 59.49	0.179 4477	0.178 6628	0.176 1863
16	244 58 32.5	31 54.22	28.7	0 30 50.5	0 59.41	0.178 6957	0.173 6977	0.171 1969
18	246 2 27.6	32 0.89	30.4	0 32 49.2	0 59.30	0.177 9425	0.168 6841	0.166 1592
20	247 6 36.1	32 7.60	32.0	0 34 47.6	0 59.14	0.177 1884	0.163 6222	0.161 0729
22	248 10 58.1	32 14.35	+ 33.6	− 0 36 45.7	− 0 58.95	0.176 4336	0.158 5118	0.155 9391
24	249 15 33.5	32 21.12	35.2	0 38 43.4	0 58.74	0.175 6784	0.153 3549	0.150 7592
26	250 20 22.5	32 27.90	36.7	0 40 40.7	0 58.51	0.174 9232	0.148 1522	0.145 5342
28	251 25 25.1	32 34.70	38.1	0 42 37.5	0 58.27	0.174 1681	0.142 9050	0.140 2647
30	252 30 41.3	32 41.53	39.5	0 44 33.8	0 58.02	0.173 4134	0.137 6132	0.134 9505
Apr. 1	253 36 11.2	32 48.38	+ 40.9	− 0 46 29.6	− 0 57.73	0.172 6595	0.132 2767	0.129 5918
3	254 41 54.8	32 55.25	+ 42.2	− 0 48 25.0	− 0 57.39	0.171 9065	0.126 8958	0.124 1887

MARS.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth— At Date.	Logarithm of Distance from Earth— At Intermediate Date.
	° ′ ″	′ ″	″	° ′ ″	′ ″			
Apr. 1	253 36 11.2	32 48.38	+40.9	−0 46 29.6	−0 57.73	0.172 6595	0.132 2767	0.129 5918
3	254 41 54.8	32 55.25	42.2	0 48 25.0	0 57.39	0.171 9065	0.126 8958	0.124 1887
5	255 47 52.2	33 2.14	43.5	0 50 19.3	0 57.04	0.171 1549	0.121 4705	0.118 7410
7	256 54 3.4	33 9.03	44.6	0 52 13.0	0 56.68	0.170 4049	0.116 0001	0.113 2477
9	258 0 28.4	33 15.92	45.7	0 54 6.0	0 56.30	0.169 6567	0.110 4836	0.107 7079
11	259 7 7.1	33 22.81	+46.8	−0 55 58.2	−0 55.89	0.168 9108	0.104 9206	0.102 1216
13	260 13 59.6	33 29.71	47.8	0 57 49.5	0 55.44	0.168 1674	0.099 3108	0.096 4880
15	261 21 5.9	33 36.61	48.7	0 59 39.8	0 54.95	0.167 4269	0.093 6532	0.090 8064
17	262 28 26.1	33 43.50	49.6	1 1 29.1	0 54.42	0.166 6895	0.087 9478	0.085 0774
19	263 36 0.0	33 50.39	50.4	1 3 17.4	0 53.87	0.165 9555	0.082 1954	0.079 3018
21	264 43 47.7	33 57.28	+51.1	−1 5 4.6	−0 53.29	0.165 2252	0.076 3967	0.073 4802
23	265 51 49.2	34 4.15	51.7	1 6 50.6	0 52.69	0.164 4991	0.070 5526	0.067 6140
25	267 0 4.4	34 11.00	52.3	1 8 35.4	0 52.07	0.163 7774	0.064 6644	0.061 7037
27	268 8 33.2	34 17.83	52.7	1 10 18.9	0 51.43	0.163 0605	0.058 7321	0.055 7496
29	269 17 15.7	34 24.63	53.1	1 12 1.1	0 50.75	0.162 3486	0.052 7563	0.049 7524
May 1	270 26 11.7	34 31.39	+53.4	−1 13 41.9	−0 50.03	0.161 6422	0.046 7376	0.043 7118
3	271 35 21.2	34 38.13	53.6	1 15 21.2	0 49.28	0.160 9416	0.040 6748	0.037 6261
5	272 44 44.2	34 44.83	53.7	1 16 59.0	0 48.50	0.160 2470	0.034 5660	0.031 4948
7	273 54 20.5	34 51.50	53.8	1 18 35.2	0 47.69	0.159 5588	0.028 4121	0.025 3177
9	275 4 10.1	34 58.13	53.7	1 20 9.8	0 46.85	0.158 8774	0.022 2113	0.019 0928
11	276 14 13.0	35 4.70	+53.6	−1 21 42.7	−0 45.99	0.158 2031	0.015 9621	0.012 8193
13	277 24 28.9	35 11.20	53.4	1 23 13.9	0 45.10	0.157 5363	0.009 6643	0.006 4969
15	278 34 57.7	35 17.65	53.1	1 24 43.2	0 44.18	0.156 8773	0.003 3171	0.000 1248
17	279 45 39.4	35 24.06	52.7	1 26 10.6	0 43.24	0.156 2264	9.996 9203	9.993 7037
19	280 56 33.9	35 30.41	52.2	1 27 36.1	0 42.26	0.155 5839	9.990 4751	9.987 2347
21	282 7 41.0	35 36.68	+51.6	−1 28 59.6	−0 41.25	0.154 9503	9.983 9824	9.980 7185
23	283 19 0.6	35 42.87	50.9	1 30 21.1	0 40.21	0.154 3259	9.977 4431	9.974 1561
25	284 30 32.5	35 48.98	50.1	1 31 40.4	0 39.14	0.153 7109	9.970 8577	9.967 5480
27	285 42 16.5	35 55.01	49.2	1 32 57.6	0 38.04	0.153 1058	9.964 2268	9.960 8942
29	286 54 12.5	36 0.96	48.3	1 34 12.6	0 36.92	0.152 5109	9.957 5500	9.954 1941
31	288 6 20.4	36 6.83	+47.3	−1 35 25.2	−0 35.77	0.151 9265	9.950 8264	9.947 4470
June 2	289 18 39.9	36 12.61	46.1	1 36 35.6	0 34.59	0.151 3529	9.944 0557	9.940 6522
4	290 31 10.8	36 18.30	44.9	1 37 43.5	0 33.38	0.150 7904	9.937 2364	9.933 8082
6	291 43 53.0	36 23.88	43.7	1 38 49.0	0 32.15	0.150 2395	9.930 3674	9.926 9136
8	292 56 46.3	36 29.35	42.3	1 39 52.1	0 30.90	0.149 7004	9.923 4467	9.919 9665
10	294 9 50.3	36 34.70	+40.8	−1 40 52.6	−0 29.62	0.149 1735	9.916 4729	9.912 9659
12	295 23 5.0	36 39.95	39.3	1 41 50.4	0 28.31	0.148 6590	9.909 4456	9.905 9119
14	296 36 30.0	36 45.08	37.7	1 42 45.6	0 26.97	0.148 1573	9.902 3648	9.898 8045
16	297 50 5.2	36 50.08	36.0	1 43 38.2	0 25.60	0.147 6687	9.895 2311	9.891 6449
18	299 3 50.2	36 54.95	34.3	1 44 28.0	0 24.20	0.147 1934	9.888 0462	9.884 4352
20	300 17 44.8	36 59.69	+32.5	−1 45 15.0	−0 22.78	0.146 7317	9.880 8119	9.877 1764
22	301 31 48.8	37 4.30	30.6	1 45 59.1	0 21.35	0.146 2840	9.873 5288	9.869 8695
24	302 46 2.0	37 8.77	28.7	1 46 40.4	0 19.91	0.145 8506	9.866 1985	9.862 5159
26	304 0 23.9	37 13.09	26.7	1 47 18.8	0 18.44	0.145 4317	9.858 8217	9.855 1160
28	305 14 54.3	37 17.26	24.6	1 47 54.3	0 16.95	0.145 0275	9.851 3987	9.847 6698
30	306 29 32.9	37 21.30	+22.5	−1 48 26.8	−0 15.45	0.144 6384	9.843 9294	9.840 1774
July 2	307 44 19.3	37 25.19	+20.3	−1 48 56.2	−0 13.95	0.144 2646	9.836 4138	9.832 6385

MARS.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
							At Date.	At Intermediate Date.
	° ′ ″	′ ″	″	° ′ ″	′ ″			
July 2	307 44 19.3	37 25.19	+ 20.3	− 1 48 56.2	− 0 13.95	0.144 2646	9.836 4138	9.832 6385
4	308 59 13.5	37 28.93	18.2	1 49 22.6	0 12.44	0.143 9063	9.828 8514	9.825 0525
6	310 14 15.0	37 32.50	15.9	1 49 46.0	0 10.90	0.143 5638	9.821 2418	9.817 4193
8	311 29 23.4	37 35.90	13.7	1 50 6.2	0 9.32	0.143 2373	9.813 5850	9.809 7391
10	312 44 38.5	37 39.14	11.4	1 50 23.3	0 7.74	0.142 9270	9.805 8818	9.802 0137
12	313 59 59.9	37 42.20	+ 9.4	− 1 50 37.2	− 0 6.17	0.142 6331	9.798 1354	9.794 2472
14	315 15 27.2	37 45.10	6.8	1 50 48.0	0 4.60	0.142 3559	9.790 3497	9.786 4434
16	316 31 0.2	37 47.83	4.4	1 50 55.6	0 3.01	0.142 0954	9.782 5291	9.778 6075
18	317 46 38.5	37 50.38	+ 2.0	1 51 0.0	− 0 1.39	0.141 8519	9.774 6796	9.770 7461
20	319 2 21.6	37 52.75	− 0.3	1 51 1.1	+ 0 0.24	0.141 6256	9.766 8078	9.762 8657
22	320 18 9.3	37 54.93	− 2.7	− 1 50 59.0	+ 0 1.86	0.141 4166	9.758 9206	9.754 9733
24	321 34 1.2	37 56.93	5.1	1 50 53.7	0 3.48	0.141 2250	9.751 0246	9.747 0752
26	322 49 56.9	37 58.75	7.4	1 50 45.1	0 5.10	0.141 0510	9.743 1259	9.739 1777
28	324 5 56.0	38 0.39	9.8	1 50 33.3	0 6.72	0.140 8947	9.735 2317	9.731 2889
30	325 21 58.3	38 1.84	12.1	1 50 18.2	0 8.34	0.140 7562	9.727 3502	9.723 4167
Aug. 1	326 38 3.3	38 3.09	− 14.4	− 1 49 59.9	+ 0 9.96	0.140 6356	9.719 4896	9.715 5699
3	327 54 10.6	38 4.14	16.7	1 49 38.4	0 11.58	0.140 5330	9.711 6586	9.707 7572
5	329 10 19.8	38 5.01	18.9	1 49 13.6	0 13.20	0.140 4484	9.703 8673	9.699 9908
7	330 26 30.5	38 5.70	21.1	1 48 45.6	0 14.82	0.140 3820	9.696 1294	9.692 2852
9	331 42 42.5	38 6.20	23.3	1 48 14.3	0 16.43	0.140 3337	9.688 4605	9.684 6578
11	332 58 55.2	38 6.49	− 25.4	− 1 47 39.8	+ 0 18.02	0.140 3036	9.680 8799	9.677 1296
13	334 15 8.1	38 6.59	27.5	1 47 2.2	0 19.59	0.140 2917	9.673 4098	9.669 7236
15	335 31 21.2	38 6.50	29.5	1 46 21.5	0 21.15	0.140 2981	9.666 0744	9.662 4653
17	336 47 34.0	38 6.21	31.5	1 45 37.6	0 22.71	0.140 3227	9.658 8996	9.655 3805
19	338 3 45.9	38 5.71	33.4	1 44 50.6	0 24.26	0.140 3655	9.651 9116	9.648 4963
21	339 19 56.7	38 5.03	− 35.2	− 1 44 0.5	+ 0 25.79	0.140 4264	9.645 1383	9.641 8411
23	340 36 5.9	38 4.18	37.0	1 43 7.4	0 27.30	0.140 5055	9.638 6086	9.635 4447
25	341 52 13.3	38 3.15	38.7	1 42 11.3	0 28.78	0.140 6027	9.632 3532	9.629 3380
27	343 8 18.3	38 1.91	40.3	1 41 12.2	0 30.26	0.140 7178	9.626 4028	9.623 5514
29	344 24 20.6	38 0.47	41.8	1 40 10.2	0 31.72	0.140 8509	9.620 7877	9.618 1156
31	345 40 19.9	37 58.83	− 43.3	− 1 39 5.3	+ 0 33.18	0.141 0019	9.615 5391	9.613 0624
Sept. 2	346 56 15.8	37 56.99	44.7	1 37 57.5	0 34.62	0.141 1705	9.610 6900	9.608 4263
4	348 12 7.8	37 54.98	45.9	1 36 46.9	0 36.02	0.141 3568	9.606 2759	9.604 2436
6	349 27 55.6	37 52.80	47.1	1 35 33.5	0 37.38	0.141 5606	9.602 3337	9.600 5506
8	350 43 38.9	37 50.45	48.2	1 34 17.4	0 38.70	0.141 7817	9.598 8989	9.597 3830
10	351 59 17.3	37 47.93	− 49.2	− 1 32 58.7	+ 0 40.00	0.142 0200	9.596 0073	9.594 7761
12	353 14 50.5	37 45.22	50.1	1 31 37.4	0 41.29	0.142 2753	9.593 6932	9.592 7623
14	354 30 18.1	37 42.33	50.9	1 30 13.6	0 42.56	0.142 5475	9.591 9866	9.591 3686
16	355 45 39.7	37 39.27	51.7	1 28 47.2	0 43.80	0.142 8364	9.590 9107	9.590 6151
18	357 0 55.0	37 36.05	52.3	1 27 18.4	0 45.00	0.143 1417	9.590 4839	9.590 5185
20	358 16 3.8	37 32.66	− 52.7	− 1 25 47.2	+ 0 46.16	0.143 4633	9.590 7196	9.591 0876
22	359 31 5.6	37 29.11	53.2	1 24 13.7	0 47.30	0.143 8010	9.591 6225	9.592 3244
24	0 46 0.1	37 25.40	53.5	1 22 38.0	0 48.40	0.144 1545	9.593 1928	9.594 2263
26	2 0 47.1	37 21.54	53.7	1 21 0.0	0 49.48	0.144 5236	9.595 4233	9.596 7821
28	3 15 26.2	37 17.53	53.8	1 19 19.9	0 50.53	0.144 9081	9.598 3009	9.599 9776
30	4 29 57.1	37 13.37	− 53.8	− 1 17 37.8	+ 0 51.55	0.145 3077	9.601 8100	9.603 7955
Oct. 2	5 44 19.5	37 9.06	− 53.7	− 1 15 53.7	+ 0 52.54	0.145 7222	9.605 9314	9.608 2149

MARS.

GREENWICH MEAN NOON.

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							At Date.	At Intermediate Date.
	° ′ ″	′ ″	″	° ′ ″	′ ″			
Oct. 2	5 44 19.5	37 9.06	− 53.7	− 1 15 53.7	+ 0 52.54	0.145 7222	9.605 9314	9.608 2149
4	6 58 33.2	37 4.60	53.5	1 14 7.7	0 53.50	0.146 1513	9.610 6431	9.613 2130
6	8 12 37.8	37 0.01	53.2	1 12 19.8	0 54.41	0.146 5946	9.615 9210	9.618 7634
8	9 26 33.2	36 55.29	52.8	1 10 30.1	0 55.28	0.147 0520	9.621 7365	9.624 8363
10	10 40 19.0	36 50.44	52.3	1 8 38.8	0 56.11	0.147 5232	9.628 0587	9.631 3991
12	11 53 54.9	36 45.46	− 51.7	− 1 6 45.8	+ 0 56.90	0.148 0078	9.634 8529	9.638 4156
14	13 7 20.7	36 40.36	51.0	1 4 51.2	0 57.67	0.148 5056	9.642 0824	9.645 8484
16	14 20 36.2	36 35.14	50.2	1 2 55.1	0 58.41	0.149 0162	9.649 7088	9.653 6586
18	15 33 41.2	36 29.82	49.4	1 0 57.6	0 59.11	0.149 5394	9.657 6929	9.661 8068
20	16 46 35.5	36 24.39	48.4	0 58 58.7	0 59.78	0.150 0748	9.665 9955	9.670 2544
22	17 59 18.7	36 18.86	− 47.4	− 0 56 58.5	+ 1 0.40	0.150 6222	9.674 5789	9.678 9644
24	19 11 50.8	36 13.22	46.3	0 54 57.1	1 0.98	0.151 1811	9.683 4066	9.687 9011
26	20 24 11.5	36 7.48	45.1	0 52 54.6	1 1.53	0.151 7513	9.692 4438	9.697 0309
28	21 36 20.6	36 1.66	43.8	0 50 51.0	1 2.05	0.152 3325	9.701 6591	9.706 3251
30	22 48 18.0	35 55.75	42.5	0 48 46.3	1 2.54	0.152 9243	9.711 0257	9.715 7579
Nov. 1	24 0 3.5	35 49.74	− 41.1	− 0 46 40.7	+ 1 2.99	0.153 5263	9.720 5189	9.725 3059
3	25 11 36.9	35 43.64	39.6	0 44 34.3	1 3.40	0.154 1383	9.730 1165	9.734 9483
5	26 22 58.0	35 37.46	38.0	0 42 27.1	1 3.77	0.154 7599	9.739 7989	9.744 6658
7	27 34 6.7	35 31.23	36.4	0 40 19.2	1 4.12	0.155 3907	9.749 5464	9.754 4383
9	28 45 2.9	35 24.94	34.7	0 38 10.6	1 4.44	0.156 0305	9.759 3392	9.764 2471
11	29 55 46.5	35 18.58	− 33.0	− 0 36 1.4	+ 1 4.73	0.156 6789	9.769 1602	9.774 0764
13	31 6 17.3	35 12.15	31.2	0 33 51.7	1 4.98	0.157 3355	9.778 9937	9.783 9099
15	32 16 35.1	35 5.68	29.4	0 31 41.5	1 5.19	0.158 0000	9.788 8232	9.793 7319
17	33 26 39.9	34 59.16	27.6	0 29 31.0	1 5.36	0.158 6721	9.798 6344	9.803 5293
19	34 36 31.7	34 52.58	25.7	0 27 20.1	1 5.51	0.159 3514	9.808 4152	9.813 2906
21	35 46 10.2	34 45.95	− 23.7	− 0 25 8.9	+ 1 5.63	0.160 0376	9.818 1540	9.823 0042
23	36 55 35.4	34 39.28	21.8	0 22 57.5	1 5.72	0.160 7303	9.827 8402	9.832 6613
25	38 4 47.3	34 32.58	19.8	0 20 46.1	1 5.78	0.161 4292	9.837 4667	9.842 2555
27	39 13 45.8	34 25.85	17.8	0 18 34.5	1 5.80	0.162 1340	9.847 0272	9.851 7813
29	40 22 30.7	34 19.09	15.7	0 16 22.9	1 5.79	0.162 8443	9.856 5174	9.861 2352
Dec. 1	41 31 2.1	34 12.30	− 13.6	− 0 14 11.4	+ 1 5.75	0.163 5597	9.865 9342	9.870 6140
3	42 39 19.9	34 5.50	11.6	0 11 59.9	1 5.69	0.164 2800	9.875 2743	9.879 9149
5	43 47 24.1	33 58.68	9.5	0 9 48.6	1 5.60	0.165 0049	9.884 5352	9.889 1347
7	44 55 14.6	33 51.84	7.4	0 7 37.5	1 5.47	0.165 7340	9.893 7130	9.898 2698
9	46 2 51.4	33 45.00	5.3	0 5 26.7	1 5.32	0.166 4669	9.902 8048	9.907 3176
11	47 10 14.6	33 38.14	− 3.2	− 0 3 16.2	+ 1 5.15	0.167 2034	9.911 8078	9.916 2751
13	48 17 24.0	33 31.27	− 1.1	− 0 1 6.0	1 4.95	0.167 9432	9.920 7190	9.925 1391
15	49 24 19.7	33 24.40	+ 1.0	+ 0 1 3.7	1 4.73	0.168 6858	9.929 5351	9.933 9068
17	50 31 1.6	33 17.53	3.1	0 3 12.9	1 4.50	0.169 4311	9.938 2539	9.942 5761
19	51 37 29.8	33 10.67	5.2	0 5 21.7	1 4.25	0.170 1787	9.946 8731	9.951 1448
21	52 43 44.3	33 3.82	+ 7.2	+ 0 7 29.9	+ 1 3.95	0.170 9282	9.955 3909	9.959 6112
23	53 49 45.1	32 56.98	9.3	0 9 37.5	1 3.62	0.171 6795	9.963 8060	9.967 9756
25	54 55 32.2	32 50.15	11.3	0 11 44.4	1 3.27	0.172 4321	9.972 1200	9.976 2390
27	56 1 5.6	32 43.33	13.3	0 13 50.6	1 2.90	0.173 1859	9.980 3328	9.984 4016
29	57 6 25.5	32 36.52	15.3	0 15 56.1	1 2.52	0.173 9404	9.988 4456	9.992 4650
31	58 11 31.7	32 29.71	+ 17.2	+ 0 18 0.8	+ 1 2.15	0.174 6955	9.996 4599	0.000 4304
33	59 16 24.4	32 22.97	+ 19.1	+ 0 20 4.7	+ 1 1.77	0.175 4509	0.004 3765	0.008 2984

JUPITER.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
							At Date.	At Intermediate Date.
	° ′ ″	′ ″	″	° ′ ″	″			
Jan. 3	155 14 45.3	4 37.80	+ 25.0	+ 1 4 55.4	+ 3.57	0.732 1773	0.687 1137	0.684 6232
7	155 33 16.3	4 37.71	24.9	1 5 9.6	3.55	0.732 2481	0.682 1700	0.679 7581
11	155 51 47.0	4 37.62	24.8	1 5 23.7	3.52	0.732 3184	0.677 3917	0.675 0756
15	156 10 17.3	4 37.53	24.7	1 5 37.7	3.49	0.732 3882	0.672 8147	0.670 6134
19	156 28 47.3	4 37.44	24.6	1 5 51.5	3.46	0.732 4576	0.668 4761	0.666 4074
23	156 47 16.9	4 37.36	+ 24.5	+ 1 6 5.3	+ 3.43	0.732 5265	0.664 4120	0.662 4943
27	157 5 46.2	4 37.27	24.4	1 6 19.0	3.40	0.732 5948	0.660 6586	0.658 9090
31	157 24 15.1	4 37.18	24.2	1 6 32.5	3.37	0.732 6625	0.657 2496	0.655 6842
Feb. 4	157 42 43.7	4 37.09	24.1	1 6 45.9	3.33	0.732 7297	0.654 2163	0.652 8493
8	158 1 11.9	4 37.01	23.9	1 6 59.1	3.30	0.732 7964	0.651 5863	0.650 4304
12	158 19 39.9	4 36.93	+ 23.8	+ 1 7 12.3	+ 3.27	0.732 8627	0.649 3846	0.648 4517
16	158 38 7.4	4 36.85	23.7	1 7 25.3	3.24	0.732 9283	0.647 6345	0.646 9354
20	158 56 34.7	4 36.77	23.5	1 7 38.2	3.21	0.732 9934	0.646 3565	0.645 8993
24	159 15 1.6	4 36.69	23.4	1 7 51.0	3.18	0.733 0580	0.645 5649	0.645 3541
28	159 33 28.2	4 36.61	23.2	1 8 3.7	3.15	0.733 1221	0.645 2668	0.645 3027
Mar. 4	159 51 54.5	4 36.53	+ 23.1	+ 1 8 16.3	+ 3.12	0.733 1856	0.645 4614	0.645 7423
8	160 10 20.4	4 36.45	23.0	1 8 28.7	3.09	0.733 2485	0.646 1445	0.646 6668
12	160 28 46.1	4 36.37	22.8	1 8 41.0	3.06	0.733 3109	0.647 3077	0.648 0656
16	160 47 11.4	4 36.29	22.7	1 8 53.2	3.03	0.733 3728	0.648 9386	0.649 9247
20	161 5 36.4	4 36.21	22.5	1 9 5.3	3.00	0.733 4342	0.651 0215	0.652 2259
24	161 24 1.1	4 36.14	+ 22.4	+ 1 9 17.2	+ 2.97	0.733 4951	0.653 5344	0.654 9434
28	161 42 25.5	4 36.06	22.2	1 9 29.0	2.94	0.733 5554	0.656 4493	0.658 0483
Apr. 1	162 0 49.6	4 35.98	22.1	1 9 40.7	2.91	0.733 6151	0.659 7362	0.661 5088
5	162 19 13.4	4 35.90	21.9	1 9 52.3	2.88	0.733 6743	0.663 3620	0.665 2918
9	162 37 36.9	4 35.83	21.7	1 10 3.8	2.85	0.733 7330	0.667 2942	0.669 3653
13	162 56 0.1	4 35.76	+ 21.5	+ 1 10 15.1	+ 2.82	0.733 7912	0.671 5011	0.673 6974
17	163 14 23.1	4 35.69	21.4	1 10 26.3	2.79	0.733 8487	0.675 9500	0.678 2547
21	163 32 45.7	4 35.62	21.2	1 10 37.4	2.76	0.733 9057	0.680 6070	0.683 0026
25	163 51 8.0	4 35.55	21.0	1 10 48.3	2.73	0.733 9622	0.685 4373	0.687 9069
29	164 9 30.1	4 35.48	20.8	1 10 59.2	2.70	0.734 0182	0.690 4073	0.692 9343
May 3	164 27 51.9	4 35.41	+ 20.6	+ 1 11 9.9	+ 2.66	0.734 0736	0.695 4841	0.698 0534
7	164 46 13.4	4 35.34	20.5	1 11 20.5	2.63	0.734 1285	0.700 6390	0.703 2376
11	165 4 34.7	4 35.27	20.3	1 11 30.9	2.60	0.734 1828	0.705 8459	0.708 4607
15	165 22 55.6	4 35.20	20.1	1 11 41.3	2.57	0.734 2365	0.711 0791	0.713 6983
19	165 41 16.3	4 35.13	19.9	1 11 51.4	2.54	0.734 2896	0.716 3155	0.718 9274
23	165 59 36.7	4 35.07	+ 19.7	+ 1 12 1.6	+ 2.51	0.734 3421	0.721 5307	0.724 1226
27	166 17 56.9	4 35.00	19.5	1 12 11.5	2.47	0.734 3942	0.726 7009	0.729 2634
31	166 36 16.8	4 34.93	19.3	1 12 21.4	2.44	0.734 4457	0.731 8077	0.734 3318
June 4	166 54 36.4	4 34.87	19.1	1 12 31.1	2.41	0.734 4966	0.736 8340	0.739 3126
8	167 12 55.8	4 34.81	18.9	1 12 40.7	2.38	0.734 5469	0.741 7660	0.744 1925
12	167 31 15.0	4 34.75	+ 18.7	+ 1 12 50.1	+ 2.35	0.734 5967	0.746 5905	0.748 9583
16	167 49 33.9	4 34.69	18.5	1 12 59.5	2.31	0.734 6460	0.751 2942	0.753 5967
20	168 7 52.5	4 34.63	18.3	1 13 8.6	2.28	0.734 6947	0.755 8641	0.758 0950
24	168 26 10.9	4 34.57	18.1	1 13 17.7	2.25	0.734 7428	0.760 2881	0.762 4422
28	168 44 29.1	4 34.51	17.9	1 13 26.7	2.22	0.734 7903	0.764 5562	0.766 6294
July 2	169 2 47.0	4 34.46	+ 17.6	+ 1 13 35.5	+ 2.19	0.734 8371	0.768 6611	0.770 6505
6	169 21 4.7	4 34.40	+ 17.4	+ 1 13 44.2	+ 2.15	0.734 8835	0.772 5969	0.774 4995

JUPITER.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
							At Date.	At Intermediate Date.
	° ′ ″	′ ″	″	° ′ ″	″			
July 2	169 2 47.0	4 34.46	+ 17.6	+ 1 13 35.5	+ 2.19	0.734 8371	0.768 6611	0.770 6505
6	169 21 4.7	4 34.40	17.4	1 13 44.2	2.15	0.734 8835	0.772 5969	0.774 4995
10	169 39 22.2	4 34.34	17.2	1 13 52.8	2.12	0.734 9293	0.776 3575	0.778 1703
14	169 57 39.4	4 34.28	17.0	1 14 1.2	2.09	0.734 9745	0.779 9369	0.781 6564
18	170 15 56.4	4 34.22	16.8	1 14 9.5	2.06	0.735 0191	0.783 3281	0.784 9511
22	170 34 13.2	4 34.17	+ 16.5	+ 1 14 17.7	+ 2.03	0.735 0631	0.786 5248	0.788 0486
26	170 52 29.8	4 34.11	16.3	1 14 25.8	1.99	0.735 1066	0.789 5223	0.790 9456
30	171 10 46.1	4 34.05	16.1	1 14 33.8	1.96	0.735 1495	0.792 3181	0.793 6395
Aug. 3	171 29 2.3	4 34.00	15.9	1 14 41.6	1.93	0.735 1918	0.794 9097	0.796 1285
7	171 47 18.2	4 33.95	15.7	1 14 49.2	1.90	0.735 2336	0.797 2952	0.798 4094
11	172 5 33.9	4 33.90	+ 15.4	+ 1 14 56.8	+ 1.87	0.735 2748	0.799 4706	0.800 4785
15	172 23 49.4	4 33.85	15.2	1 15 4.2	1.83	0.735 3154	0.801 4327	0.802 3325
19	172 42 4.7	4 33.80	14.9	1 15 11.5	1.80	0.735 3554	0.803 1778	0.803 9682
23	173 0 19.9	4 33.75	14.7	1 15 18.7	1.77	0.735 3948	0.804 7036	0.805 3840
27	173 18 34.8	4 33.70	14.4	1 15 25.7	1.74	0.735 4336	0.806 0092	0.806 5791
31	173 36 49.5	4 33.66	+ 14.2	+ 1 15 32.6	+ 1.71	0.735 4718	0.807 0938	0.807 5533
Sept. 4	173 55 4.1	4 33.61	14.0	1 15 39.4	1.67	0.735 5095	0.807 9572	0.808 3054
8	174 13 18.4	4 33.56	13.7	1 15 46.1	1.64	0.735 5466	0.808 5974	0.808 8331
12	174 31 32.6	4 33.51	13.5	1 15 52.6	1.61	0.735 5831	0.809 0120	0.809 1337
16	174 49 46.6	4 33.47	13.2	1 15 59.0	1.58	0.735 6190	0.809 1984	0.809 2059
20	175 8 0.4	4 33.43	+ 13.0	+ 1 16 5.3	+ 1.55	0.735 6544	0.809 1562	0.809 0493
24	175 26 14.0	4 33.38	12.7	1 16 11.4	1.51	0.735 6892	0.808 8853	0.808 6640
28	175 44 27.5	4 33.34	12.5	1 16 17.4	1.48	0.735 7234	0.808 3858	0.808 0511
Oct. 2	176 2 40.8	4 33.30	12.2	1 16 23.3	1.45	0.735 7570	0.807 6595	0.807 2107
6	176 20 53.9	4 33.26	12.0	1 16 29.0	1.42	0.735 7899	0.806 7045	0.806 1407
10	176 39 6.9	4 33.22	+ 11.7	+ 1 16 34.6	+ 1.39	0.735 8222	0.805 5195	0.804 8409
14	176 57 19.7	4 33.18	11.4	1 16 40.1	1.35	0.735 8540	0.804 1048	0.803 3111
18	177 15 32.3	4 33.14	11.2	1 16 45.5	1.32	0.735 8852	0.802 4601	0.801 5520
22	177 33 44.8	4 33.10	10.9	1 16 50.7	1.29	0.735 9158	0.800 5871	0.799 5660
26	177 51 57.1	4 33.06	10.7	1 16 55.8	1.26	0.735 9458	0.798 4889	0.797 3561
30	178 10 9.3	4 33.03	+ 10.4	+ 1 17 0.8	+ 1.23	0.735 9753	0.796 1678	0.794 9242
Nov. 3	178 28 21.4	4 32.99	10.1	1 17 5.6	1.19	0.736 0041	0.793 6253	0.792 2711
7	178 46 33.3	4 32.95	9.9	1 17 10.3	1.16	0.736 0323	0.790 8618	0.789 3980
11	179 4 45.0	4 32.92	9.6	1 17 14.9	1.12	0.736 0599	0.787 8800	0.786 3082
15	179 22 56.7	4 32.89	9.4	1 17 19.4	1.09	0.736 0870	0.784 6834	0.783 0065
19	179 41 8.2	4 32.86	+ 9.1	+ 1 17 23.7	+ 1.06	0.736 1135	0.781 2780	0.779 4986
23	179 59 19.5	4 32.82	8.8	1 17 27.8	1.03	0.736 1394	0.777 6692	0.775 7909
27	180 17 30.8	4 32.79	8.6	1 17 31.9	1.00	0.736 1647	0.773 8644	0.771 8903
Dec. 1	180 35 41.9	4 32.76	8.3	1 17 35.8	0.96	0.736 1894	0.769 8693	0.767 8021
5	180 53 52.9	4 32.73	8.0	1 17 39.6	0.93	0.736 2134	0.765 6897	0.763 5332
9	181 12 3.8	4 32.70	+ 7.7	+ 1 17 43.3	+ 0.90	0.736 2368	0.761 3338	0.759 0928
13	181 30 14.5	4 32.67	7.5	1 17 46.8	0.86	0.736 2597	0.756 8118	0.754 4924
17	181 48 25.2	4 32.64	7.2	1 17 50.2	0.83	0.736 2820	0.752 1362	0.749 7451
21	182 6 35.7	4 32.61	6.9	1 17 53.5	0.80	0.736 3037	0.747 3208	0.744 8653
25	182 24 46.2	4 32.59	6.6	1 17 56.6	0.77	0.736 3247	0.742 3808	0.739 8681
29	182 42 56.5	4 32.57	+ 6.3	+ 1 17 59.6	+ 0.73	0.736 3451	0.737 3299	0.734 7680
33	183 1 6.7	4 32.55	+ 6.0	+ 1 18 2.5	+ 0.70	0.736 3649	0.732 1845	0.729 5817

SATURN.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth--	
							At Date.	At Intermediate Date.
	° ′ ″	′ ″	′ ″	° ′ ″	″			
Jan. 3	9 59 7.5	2 3.15	+0 42.4	−2 25 41.5	−1.20	0.974 6170	0.978 9300	0.980 4186
7	10 7 20.2	2 3.19	0 42.0	2 25 46.2	1.19	0.974 5609	0.981 8931	0.983 3519
11	10 15 33.0	2 3.22	0 41.5	2 25 50.9	1.17	0.974 5048	0.984 7936	0.986 2169
15	10 23 46.0	2 3.26	0 41.1	2 25 55.6	1.16	0.974 4488	0.987 6206	0.989 0032
19	10 31 59.1	2 3.29	0 40.7	2 26 0.2	1.15	0.974 3927	0.990 3634	0.991 6999
23	10 40 12.3	2 3.32	+0 40.3	−2 26 4.8	−1.14	0.974 3367	0.993 0113	0.994 2965
27	10 48 25.6	2 3.35	0 39.8	2 26 9.3	1.12	0.974 2806	0.995 5542	0.996 7834
31	10 56 39.0	2 3.38	0 39.4	2 26 13.8	1.11	0.974 2246	0.997 9834	0.999 1532
Feb. 4	11 4 52.6	2 3.41	0 39.0	2 26 18.2	1.10	0.974 1686	1.000 2920	1.001 3991
8	11 13 6.3	2 3.44	0 38.6	2 26 22.6	1.09	0.974 1127	1.002 4738	1.003 5153
12	11 21 20.1	2 3.47	+0 38.1	−2 26 26.9	−1.07	0.974 0567	1.004 5229	1.005 4959
16	11 29 34.0	2 3.50	0 37.7	2 26 31.2	1.06	0.974 0007	1.006 4335	1.007 3351
20	11 37 48.1	2 3.53	0 37.3	2 26 35.4	1.05	0.973 9448	1.008 1999	1.009 0273
24	11 46 2.3	2 3.57	0 36.9	2 26 39.6	1.04	0.973 8889	1.009 8167	1.010 5677
28	11 54 16.6	2 3.60	0 36.4	2 26 43.7	1.03	0.973 8331	1.011 2800	1.011 9532
Mar. 4	12 2 31.0	2 3.63	+0 36.0	−2 26 47.8	−1.01	0.973 7772	1.012 5871	1.013 1814
8	12 10 45.6	2 3.66	0 35.5	2 26 51.8	1.00	0.973 7214	1.013 7358	1.014 2502
12	12 19 0.3	2 3.69	0 35.1	2 26 55.8	0.99	0.973 6655	1.014 7243	1.015 1579
16	12 27 15.1	2 3.73	0 34.7	2 26 59.8	0.98	0.973 6097	1.015 5506	1.015 9022
20	12 35 30.1	2 3.76	0 34.2	2 27 3.7	0.97	0.973 5540	1.016 2124	1.016 4809
24	12 43 45.2	2 3.79	+0 33.8	−2 27 7.5	−0.96	0.973 4982	1.016 7077	1.016 8927
28	12 52 0.4	2 3.82	0 33.3	2 27 11.3	0.94	0.973 4425	1.017 0359	1.017 1375
Apr. 1	13 0 15.7	2 3.85	0 32.9	2 27 15.0	0.93	0.973 3867	1.017 1975	1.017 2161
5	13 8 31.2	2 3.88	0 32.5	2 27 18.7	0.91	0.973 3310	1.017 1935	1.017 1296
9	13 16 46.8	2 3.91	0 32.0	2 27 22.3	0.90	0.973 2754	1.017 0246	1.016 8784
13	13 25 2.5	2 3.94	+0 31.6	−2 27 25.9	−0.89	0.973 2197	1.016 6912	1.016 4630
17	13 33 18.3	2 3.97	0 31.2	2 27 29.4	0.88	0.973 1641	1.016 1938	1.015 8837
21	13 41 34.2	2 4.00	0 30.7	2 27 32.9	0.86	0.973 1084	1.015 5329	1.015 1417
25	13 49 50.3	2 4.04	0 30.3	2 27 36.3	0.85	0.973 0528	1.014 7104	1.014 2395
29	13 58 6.5	2 4.07	0 29.8	2 27 39.7	0.84	0.972 9973	1.013 7293	1.013 1802
May 3	14 6 22.9	2 4.10	+0 29.4	−2 27 43.0	−0.83	0.972 9417	1.012 5927	1.011 9672
7	14 14 39.4	2 4.13	0 28.9	2 27 46.3	0.82	0.972 8862	1.011 3039	1.010 6033
11	14 22 56.0	2 4.17	0 28.5	2 27 49.5	0.80	0.972 8307	1.009 8656	1.009 0912
15	14 31 12.7	2 4.20	0 28.0	2 27 52.7	0.79	0.972 7753	1.008 2804	1.007 4336
19	14 39 29.5	2 4.23	0 27.5	2 27 55.9	0.78	0.972 7198	1.006 5514	1.005 6343
23	14 47 46.5	2 4.26	+0 27.1	−2 27 59.0	−0.76	0.972 6644	1.004 6831	1.003 6984
27	14 56 3.6	2 4.29	0 26.6	2 28 2.0	0.75	0.972 6090	1.002 6810	1.001 6315
31	15 4 20.8	2 4.32	0 26.2	2 28 4.9	0.74	0.972 5536	1.000 5508	0.999 4395
June 4	15 12 38.1	2 4.36	0 25.7	2 28 7.8	0.72	0.972 4983	0.998 2984	0.997 1281
8	15 20 55.6	2 4.39	0 25.2	2 28 10.7	0.71	0.972 4430	0.995 9294	0.994 7028
12	15 29 13.2	2 4.42	+0 24.8	−2 28 13.5	−0.70	0.972 3877	0.993 4492	0.992 1693
16	15 37 30.9	2 4.45	0 24.3	2 28 16.3	0.69	0.972 3324	0.990 8641	0.989 5346
20	15 45 48.8	2 4.48	0 23.9	2 28 19.0	0.67	0.972 2771	0.988 1820	0.986 8073
24	15 54 6.8	2 4.51	0 23.4	2 28 21.7	0.66	0.972 2219	0.985 4118	0.983 9967
28	16 2 24.9	2 4.54	0 22.9	2 28 24.3	0.65	0.972 1667	0.982 5631	0.981 1122
July 2	16 10 43.1	2 4.57	+0 22.5	−2 28 26.9	−0.64	0.972 1115	0.979 6452	0.978 1632
6	16 19 1.4	2 4.60	+0 22.0	−2 28 29.4	−0.63	0.972 0564	0.976 6674	0.975 1590

SATURN.

GREENWICH MEAN NOON.

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							At Date.	At Intermediate Date.
	° ′ ″	′ ″	′ ″	° ′ ″	″			
July 2	16 10 43.1	2 4.57	+0 22.5	−2 28 26.9	−0.64	0.972 1115	0.979 6452	0.978 1632
6	16 19 1.4	2 4.60	0 22.0	2 28 29.4	0.63	0.972 0564	0.976 6674	0.975 1590
10	16 27 19.9	2 4.63	0 21.6	2 28 31.9	0.61	0.972 0013	0.973 6394	0.972 1098
14	16 35 38.5	2 4.67	0 21.1	2 28 34.3	0.60	0.971 9463	0.970 5716	0.969 0265
18	16 43 57.2	2 4.70	0 20.6	2 28 36.7	0.59	0.971 8913	0.967 4762	0.965 9224
22	16 52 16.1	2 4.73	+0 20.2	−2 28 39.0	−0.57	0.971 8363	0.964 3668	0.962 8112
26	17 0 35.1	2 4.76	0 19.7	2 28 41.2	0.56	0.971 7813	0.961 2572	0.959 7066
30	17 8 54.2	2 4.79	0 19.3	2 28 43.4	0.55	0.971 7263	0.958 1612	0.956 6226
Aug. 3	17 17 13.4	2 4.83	0 18.8	2 28 45.6	0.53	0.971 6714	0.955 0925	0.953 5726
7	17 25 32.8	2 4.86	0 18.3	2 28 47.7	0.52	0.971 6165	0.952 0648	0.950 5709
11	17 33 52.3	2 4.89	+0 17.9	−2 28 49.8	−0.51	0.971 5617	0.949 0930	0.947 6330
15	17 42 11.9	2 4.92	0 17.4	2 28 51.8	0.49	0.971 5069	0.946 1931	0.944 7755
19	17 50 31.6	2 4.95	0 17.0	2 28 53.7	0.48	0.971 4521	0.943 3823	0.942 0157
23	17 58 51.4	2 4.98	0 16.5	2 28 55.6	0.47	0.971 3974	0.940 6776	0.939 3700
27	18 7 11.4	2 5.01	0 16.0	2 28 57.5	0.46	0.971 3427	0.938 0949	0.936 8541
31	18 15 31.4	2 5.04	+0 15.6	−2 28 59.3	−0.44	0.971 2880	0.935 6493	0.934 4825
Sept. 4	18 23 51.7	2 5.07	0 15.1	2 29 1.0	0.43	0.971 2333	0.933 3557	0.932 2707
8	18 32 12.1	2 5.10	0 14.7	2 29 2.7	0.42	0.971 1786	0.931 2295	0.930 2340
12	18 40 32.6	2 5.14	0 14.2	2 29 4.3	0.41	0.971 1240	0.929 2860	0.928 3875
16	18 48 53.2	2 5.17	0 13.7	2 29 5.9	0.40	0.971 0695	0.927 5403	0.926 7459
20	18 57 13.9	2 5.20	+0 13.3	−2 29 7.5	−0.38	0.971 0150	0.926 0058	0.925 3215
24	19 5 34.8	2 5.23	0 12.8	2 29 9.0	0.37	0.970 9605	0.924 6941	0.924 1248
28	19 13 55.8	2 5.26	0 12.4	2 29 10.4	0.35	0.970 9060	0.923 6146	0.923 1644
Oct. 2	19 22 16.9	2 5.30	0 11.9	2 29 11.8	0.34	0.970 8516	0.922 7750	0.922 4472
6	19 30 38.1	2 5.33	0 11.4	2 29 13.1	0.33	0.970 7972	0.922 1820	0.921 9802
10	19 38 59.4	2 5.36	+0 10.9	−2 29 14.4	−0.31	0.970 7428	0.921 8422	0.921 7686
14	19 47 20.9	2 5.39	0 10.4	2 29 15.6	0.30	0.970 6885	0.921 7597	0.921 8156
18	19 55 42.5	2 5.42	0 10.0	2 29 16.8	0.29	0.970 6342	0.921 9361	0.922 1211
22	20 4 4.3	2 5.45	0 9.5	2 29 17.9	0.27	0.970 5800	0.922 3702	0.922 6827
26	20 12 26.1	2 5.48	0 9.0	2 29 18.9	0.26	0.970 5258	0.923 0578	0.923 4948
30	20 20 48.1	2 5.51	+0 8.5	−2 29 20.0	−0.25	0.970 4716	0.923 9930	0.924 5515
Nov. 3	20 29 10.2	2 5.54	0 8.0	2 29 20.9	0.23	0.970 4175	0.925 1692	0.925 8452
7	20 37 32.4	2 5.57	0 7.6	2 29 21.8	0.22	0.970 3634	0.926 5786	0.927 3680
11	20 45 54.8	2 5.60	0 7.1	2 29 22.7	0.20	0.970 3094	0.928 2119	0.929 1088
15	20 54 17.3	2 5.63	0 6.6	2 29 23.5	0.19	0.970 2554	0.930 0569	0.931 0545
19	21 2 39.9	2 5.66	+0 6.2	−2 29 24.2	−0.18	0.970 2014	0.932 0996	0.933 1902
23	21 11 2.6	2 5.69	0 5.7	2 29 24.9	0.17	0.970 1475	0.934 3243	0.935 4998
27	21 19 25.4	2 5.73	0 5.3	2 29 25.5	0.15	0.970 0936	0.936 7148	0.937 9672
Dec. 1	21 27 48.4	2 5.76	0 4.8	2 29 26.1	0.14	0.970 0398	0.939 2549	0.940 5761
5	21 36 11.5	2 5.79	0 4.3	2 29 26.6	0.13	0.969 9860	0.941 9287	0.943 3107
9	21 44 34.7	2 5.82	+0 3.8	−2 29 27.1	−0.11	0.969 9322	0.944 7197	0.946 1537
13	21 52 58.1	2 5.85	0 3.3	2 29 27.5	0.10	0.969 8785	0.947 6104	0.949 0874
17	22 1 21.5	2 5.88	0 2.9	2 29 27.9	0.09	0.969 8248	0.950 5823	0.952 0930
21	22 9 45.1	2 5.91	0 2.4	2 29 28.3	0.08	0.969 7712	0.953 6172	0.955 1527
25	22 18 8.8	2 5.94	0 1.9	2 29 28.5	0.06	0.969 7176	0.956 6974	0.958 2492
29	22 26 32.6	2 5.97	+0 1.4	−2 29 28.7	−0.05	0.969 6641	0.959 8064	0.961 3670
33	22 34 56.6	2 6.00	+0 0.9	−2 29 28.9	−0.03	0.969 6106	0.962 9292	0.964 4911

URANUS.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.			Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.			Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
											At Date.	At Intermediate Date.
	°	′	″	″	″	°	′	″	″			
Jan. 3	286	57	28.1	40.64	+ 8.6	−0	25	29.5	− 0.46	1.291 6733	1.312 8986	1.312 9727
11	287	2	53.1	40.64	8.6	0	25	33.2	0.46	1.291 7031	1.312 9515	1.312 8345
19	287	8	18.2	40.63	8.6	0	25	36.8	0.46	1.291 7329	1.312 6219	1.312 3141
27	287	13	43.2	40.63	8.7	0	25	40.5	0.45	1.291 7626	1.311 9123	1.311 4188
Feb. 4	287	19	8.2	40.62	8.7	0	25	44.1	0.45	1.291 7923	1.310 8362	1.310 1670
12	287	24	33.1	40.62	+ 8.7	−0	25	47.8	− 0.45	1.291 8220	1.309 4133	1.308 5776
20	287	29	58.0	40.61	8.7	0	25	51.4	0.45	1.291 8517	1.307 6630	1.306 6733
28	287	35	22.7	40.60	8.7	0	25	55.0	0.45	1.291 8813	1.305 6131	1.304 4870
Mar. 8	287	40	47.6	40.60	8.7	0	25	58.6	0.45	1.291 9109	1.303 2998	1.302 0560
16	287	46	12.4	40.59	8.7	0	26	2.3	0.45	1.291 9405	1.300 7603	1.299 4180
24	287	51	37.1	40.59	+ 8.7	−0	26	5.9	− 0.45	1.291 9701	1.298 0350	1.296 6176
Apr. 1	287	57	1.8	40.58	8.7	0	26	9.5	0.45	1.291 9997	1.295 1725	1.293 7060
9	288	2	26.4	40.58	8.8	0	26	13.1	0.45	1.292 0292	1.292 2242	1.290 7336
17	288	7	51.0	40.58	8.8	0	26	16.7	0.45	1.292 0587	1.289 2409	1.287 7532
25	288	13	15.6	40.57	8.8	0	26	20.3	0.45	1.292 0882	1.286 2780	1.284 8226
May 3	288	18	40.1	40.57	+ 8.8	−0	26	23.9	− 0.45	1.292 1177	1.283 3941	1.281 9992
11	288	24	4.6	40.56	8.8	0	26	27.5	0.45	1.292 1471	1.280 6445	1.279 3366
19	288	29	29.0	40.56	8.8	0	26	31.1	0.45	1.292 1765	1.278 0826	1.276 8895
27	288	34	53.4	40.55	8.8	0	26	34.7	0.45	1.292 2059	1.275 7640	1.274 7120
June 4	288	40	17.8	40.54	8.8	0	26	38.2	0.45	1.292 2353	1.273 7388	1.272 8493
12	288	45	42.1	40.54	+ 8.8	−0	26	41.8	− 0.45	1.292 2647	1.272 0481	1.271 3402
20	288	51	6.4	40.53	8.9	0	26	45.4	0.44	1.292 2941	1.270 7304	1.270 2224
28	288	56	30.7	40.53	8.9	0	26	48.9	0.44	1.292 3234	1.269 8187	1.269 5212
July 6	289	1	54.9	40.52	8.9	0	26	52.5	0.44	1.292 3527	1.269 3316	1.269 2510
14	289	7	19.1	40.52	8.9	0	26	56.1	0.44	1.292 3820	1.269 2803	1.269 4202
22	289	12	43.2	40.51	+ 8.9	−0	26	59.6	− 0.44	1.292 4113	1.269 6701	1.270 0283
30	289	18	7.3	40.51	8.9	0	27	3.1	0.44	1.292 4406	1.270 4923	1.271 0593
Aug. 7	289	23	31.4	40.50	8.9	0	27	6.7	0.44	1.292 4698	1.271 7266	1.272 4911
15	289	28	55.4	40.50	8.9	0	27	10.2	0.44	1.292 4990	1.273 3488	1.274 2950
23	289	34	19.4	40.49	8.9	0	27	13.8	0.44	1.292 5282	1.275 3246	1.276 4318
31	289	39	43.3	40.49	+ 8.9	−0	27	17.3	− 0.44	1.292 5574	1.277 6103	1.278 8540
Sept. 8	289	45	7.2	40.48	8.9	0	27	20.8	0.44	1.292 5865	1.280 1571	1.281 5133
16	289	50	31.1	40.48	9.0	0	27	24.4	0.44	1.292 6156	1.282 9158	1.284 3570
24	289	55	54.9	40.47	9.0	0	27	27.9	0.44	1.292 6447	1.285 8294	1.287 3257
Oct. 2	290	1	18.7	40.47	9.0	0	27	31.4	0.44	1.292 6738	1.288 8389	1.290 3622
10	290	6	42.4	40.46	+ 9.0	−0	27	34.9	− 0.44	1.292 7028	1.291 8890	1.293 4122
18	290	12	6.2	40.46	9.0	0	27	38.4	0.44	1.292 7318	1.294 9242	1.296 4179
26	290	17	29.8	40.45	9.0	0	27	41.9	0.44	1.292 7608	1.297 8866	1.299 3243
Nov. 3	290	22	53.5	40.45	9.0	0	27	45.4	0.44	1.292 7897	1.300 7253	1.302 0838
11	290	28	17.1	40.44	9.0	0	27	48.9	0.43	1.292 8186	1.303 3938	1.304 6495
19	290	33	40.6	40.44	+ 9.0	−0	27	52.3	− 0.43	1.292 8475	1.305 8454	1.306 9766
27	290	39	4.2	40.44	9.0	0	27	55.8	0.43	1.292 8764	1.308 0391	1.309 0292
Dec. 5	290	44	27.7	40.43	9.0	0	27	59.3	0.43	1.292 9052	1.309 9432	1.310 7771
13	290	49	51.1	40.43	9.0	0	28	2.8	0.43	1.292 9340	1.311 5274	1.312 1910
21	290	55	14.5	40.43	9.0	0	28	6.2	0.43	1.292 9628	1.312 7655	1.313 2492
29	291	0	37.9	40.42	+ 9.1	−0	28	9.7	− 0.43	1.292 9916	1.313 6407	1.313 9388
37	291	6	1.3	40.42	+ 9.1	−0	28	13.2	− 0.43	1.293 0203	1.314 1424	. . . .

NEPTUNE.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.′	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
							At Date.	At Intermediate Date.
	° ′ ″	″	″	° ′ ″	″			
Jan. 3	105 41 58.9	21.87	− 38.2	− 0 45 14.5	+ 0.61	1.476 3948	1.461 9228	1.461 9017
11	105 44 53.8	21.87	38.1	0 45 9.6	0.61	1.476 3972	1.461 9550	1.462 0825
19	105 47 48.8	21.87	38.1	0 45 4.7	0.61	1.476 3995	1.462 2840	1.462 5586
27	105 50 43.7	21.87	38.0	0 44 59.8	0.61	1.476 4018	1.462 9043	1.463 3187
Feb. 4	105 53 38.7	21.87	38.0	0 44 54.9	0.61	1.476 4042	1.463 7991	1.464 3425
12	105 56 35.6	21.87	− 37.9	− 0 44 50.0	+ 0.61	1.476 4065	1.464 9459	1.465 6061
20	105 59 28.5	21.87	37.8	0 44 45.1	0.61	1.476 4088	1.466 3194	1.467 0815
28	106 2 23.4	21.86	37.8	0 44 40.2	0.61	1.476 4111	1.467 8878	1.468 7336
Mar. 8	106 5 18.3	21.86	37.7	0 44 35.3	0.61	1.476 4135	1.469 6144	1.470 5255
16	106 8 13.2	21.86	37.7	0 44 30.4	0.61	1.476 4158	1.471 4624	1.472 4205
24	106 11 8.1	21.86	− 37.6	− 0 44 25.5	+ 0.61	1.476 4181	1.473 3949	1.474 3804
Apr. 1	106 14 3.0	21.86	37.6	0 44 20.6	0.61	1.476 4204	1.475 3717	1.476 3640
9	106 16 57.9	21.86	37.5	0 44 15.6	0.61	1.476 4228	1.477 3531	1.478 3349
17	106 19 52.8	21.86	37.5	0 44 10.7	0.62	1.476 4251	1.479 3050	1.480 2588
25	106 22 47.7	21.86	37.4	0 44 5.8	0.62	1.476 4274	1.481 1919	1.482 1004
May 3	106 25 42.6	21.86	− 37.4	− 0 44 0.9	+ 0.62	1.476 4297	1.482 9807	1.483 8291
11	106 28 37.5	21.86	37.3	0 43 56.0	0.62	1.476 4321	1.484 6423	1.485 4174
19	106 31 32.3	21.86	37.3	0 43 51.1	0.62	1.476 4344	1.486 1515	1.486 8413
27	106 34 27.2	21.86	37.2	0 43 46.1	0.62	1.476 4367	1.487 4839	1.488 0773
June 4	106 37 22.0	21.86	37.2	0 43 41.2	0.62	1.476 4390	1.488 6196	1.489 1089
12	106 40 16.9	21.86	− 37.1	− 0 43 36.3	+ 0.62	1.476 4413	1.489 5434	1.489 9215
20	106 43 11.7	21.85	37.0	0 43 31.4	0.62	1.476 4436	1.490 2417	1.490 5027
28	106 46 6.6	21.85	37.0	0 43 26.4	0.62	1.476 4459	1.490 7035	1.490 8438
July 6	106 49 1.4	21.85	36.9	0 43 21.5	0.62	1.476 4482	1.490 9234	1.490 9421
14	106 51 56.2	21.85	36.8	0 43 16.6	0.62	1.476 4505	1.490 8996	1.490 7958
22	106 54 51.0	21.85	− 36.8	− 0 43 11.6	+ 0.62	1.476 4528	1.490 6309	1.490 4054
30	106 57 45.9	21.85	36.7	0 43 6.7	0.62	1.476 4551	1.490 1203	1.489 7769
Aug. 7	107 0 40.7	21.85	36.7	0 43 1.7	0.62	1.476 4574	1.489 3762	1.488 9193
15	107 3 35.5	21.85	36.6	0 42 56.8	0.62	1.476 4597	1.488 4077	1.487 8432
23	107 6 30.3	21.85	36.5	0 42 51.9	0.62	1.476 4620	1.487 2281	1.486 5647
31	107 9 25.1	21.85	− 36.5	− 0 42 46.9	+ 0.62	1.476 4643	1.485 8557	1.485 1037
Sept. 8	107 12 19.9	21.85	36.4	0 42 42.0	0.62	1.476 4665	1.484 3111	1.483 4809
16	107 15 14.7	21.85	36.4	0 42 37.0	0.62	1.476 4688	1.482 6166	1.481 7220
24	107 18 9.5	21.85	36.3	0 42 32.1	0.62	1.476 4711	1.480 8011	1.479 8576
Oct. 2	107 21 4.3	21.85	36.3	0 42 27.1	0.62	1.476 4734	1.478 8954	1.477 9187
10	107 23 59.0	21.85	− 36.2	− 0 42 22.2	+ 0.62	1.476 4756	1.476 9318	1.475 9392
18	107 26 53.8	21.85	36.1	0 42 17.2	0.62	1.476 4779	1.474 9455	1.473 9557
26	107 29 48.5	21.85	36.1	0 42 12.3	0.62	1.476 4802	1.472 9750	1.472 0082
Nov. 3	107 32 43.3	21.84	36.0	0 42 7.3	0.62	1.476 4825	1.471 0598	1.470 1344
11	107 35 38.1	21.84	36.0	0 42 2.4	0.62	1.476 4847	1.469 2372	1.468 3734
19	107 38 32.8	21.84	− 35.9	− 0 41 57.4	+ 0.62	1.476 4870	1.467 5477	1.466 7646
27	107 41 27.5	21.84	35.9	0 41 52.5	0.62	1.476 4893	1.466 0284	1.465 3432
Dec. 5	107 44 22.3	21.34	35.8	0 41 47.5	0.62	1.476 4916	1.464 7128	1.464 1408
13	107 47 17.0	21.84	35.7	0 41 42.5	0.62	1.476 4938	1.463 6310	1.463 1867
21	107 50 11.7	21.84	35.7	0 41 37.6	0.62	1.476 4961	1.462 8107	1.462 5051
29	107 53 6.4	21.84	− 35.6	− 0 41 32.6	+ 0.62	1.476 4984	1.462 2712	1.462 1101
37	107 56 1.1	21.84	− 35.6	− 0 41 27.6	+ 0.62	1.476 5007	1.462 0231	. . . .

FOR GREENWICH MEAN NOON AND MIDNIGHT.

Date.	X True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Y True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Z True Equinox.		Reduc. to Mean Eq'x of Jan. 0.
	Noon.	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*
Jan. 0	+0.161 4964	+0.170 1155	+ 789	−0.889 7828	−0.888 4233	+ 114	−0.385 9922	−0.385 4023	+ 67
1	0.178 7209	0.187 3121	778	0.886 9948	0.885 4975	125	0.384 7825	0.384 1328	73
2	0.195 8887	0.204 4497	767	0.883 9316	0.882 2971	136	0.383 4531	0.382 7439	78
3	0.212 9944	0.221 5223	756	0.880 5943	0.878 8233	147	0.382 0050	0.381 2364	83
4	0.230 0330	0.238 5256	744	0.876 9843	0.875 0775	157	0.380 4383	0.379 6108	88
5	+0.246 9997	+0.255 4546	+ 733	−0.873 1029	−0.871 0607	+ 167	−0.378 7539	−0.377 8677	+ 93
6	0.263 8896	0.272 3042	721	0.868 9511	0.866 7741	176	0.376 9522	0.376 0076	98
7	0.280 6977	0.289 0695	709	0.864 5300	0.862 2190	185	0.375 0338	0.374 0310	103
8	0.297 4191	0.305 7458	697	0.859 8411	0.857 3966	194	0.372 9993	0.371 9387	108
9	0.314 0489	0.322 3278	685	0.854 8856	0.852 3084	203	0.370 8493	0.369 7311	113
10	+0.330 5821	+0.338 8110	+ 673	−0.849 6650	−0.846 9554	+ 211	−0.368 5843	−0.367 4089	+ 117
11	0.347 0138	0.355 1900	661	0.844 1801	0.841 3393	219	0.366 2050	0.364 9727	122
12	0.363 3390	0.371 4601	648	0.838 4332	0.835 4618	226	0.363 7120	0.362 4230	126
13	0.379 5525	0.387 6156	636	0.832 4255	0.829 3244	234	0.361 1059	0.359 7607	130
14	0.395 6492	0.403 6526	624	0.826 1586	0.822 9285	241	0.358 3876	0.356 9866	134
15	+0.411 6250	+0.419 5656	+ 612	−0.819 6343	−0.816 2761	+ 248	−0.355 5578	−0.354 1014	+ 138
16	0.427 4738	0.435 3491	599	0.812 8543	0.809 3691	254	0.352 6173	0.351 1057	141
17	0.443 1909	0.450 9983	587	0.805 8207	0.802 2093	260	0.349 5667	0.348 0004	145
18	0.458 7708	0.466 5079	575	0.798 5353	0.794 7988	266	0.346 4070	0.344 7866	148
19	0.474 2089	0.481 8730	562	0.791 0003	0.787 1400	272	0.343 1392	0.341 4649	151
20	+0.489 4997	+0.497 0884	+ 550	−0.783 2182	−0.779 2351	+ 277	−0.339 7640	−0.338 0366	+ 154
21	0.504 6386	0.512 1492	537	0.775 1911	0.771 0867	282	0.336 2827	0.334 5025	157
22	0.519 6197	0.527 0498	525	0.766 9220	0.762 6976	287	0.332 6962	0.330 8639	160
23	0.534 4387	0.541 7857	513	0.758 4137	0.754 0708	292	0.329 0057	0.327 1220	163
24	0.549 0902	0.556 3518	501	0.749 6692	0.745 2093	296	0.325 2128	0.323 2782	165
25	+0.563 5698	+0.570 7436	+ 488	−0.740 6915	−0.736 1164	+ 300	−0.321 3184	−0.319 3337	+ 168
26	0.577 8728	0.584 9568	476	0.731 4842	0.726 7954	303	0.317 3243	0.315 2903	170
27	0.591 9950	0.598 9870	464	0.722 0504	0.717 2497	306	0.313 2319	0.311 1492	172
28	0.605 9322	0.612 8302	452	0.712 3937	0.707 4828	309	0.309 0424	0.306 9118	174
29	0.619 6804	0.626 4824	440	0.702 5173	0.697 4977	312	0.304 7576	0.302 5799	176
30	+0.633 2357	+0.639 9398	+ 428	−0.692 4244	−0.687 2980	+ 314	−0.300 3789	−0.298 1547	+ 177
31	0.646 5941	0.653 1983	416	0.682 1188	0.676 8872	317	0.295 9076	0.293 6378	179
Feb. 1	0.659 7521	0.666 2549	405	0.671 6037	0.666 2688	319	0.291 3455	0.289 0308	180
2	0.672 7061	0.679 1054	393	0.660 8828	0.655 4457	321	0.286 6939	0.284 3351	181
3	0.685 4524	0.691 7468	382	0.649 9582	0.644 4211	323	0.281 9545	0.279 5522	182
4	+0.697 9879	+0.704 1754	+ 371	−0.638 8345	−0.633 1988	+ 325	−0.277 1285	−0.274 6835	+ 183
5	0.710 3087	0.716 3875	360	0.627 5145	0.621 7821	326	0.272 2174	0.269 7305	184
6	0.722 4114	0.728 3798	349	0.616 0019	0.610 1743	328	0.267 2229	0.264 6948	185
7	0.734 2923	0.740 1486	338	0.604 2998	0.598 3788	329	0.262 1464	0.259 5778	185
8	0.745 9484	0.751 6913	327	0.592 4119	0.586 3994	330	0.256 9893	0.254 3811	186
9	+0.757 3765	+0.763 0035	+ 316	−0.580 3418	−0.574 2392	+ 331	−0.251 7534	−0.249 1061	+ 186
10	0.768 5720	0.774 0819	305	0.568 0923	0.561 9018	332	0.246 4397	0.243 7544	186
11	0.779 5327	0.784 9240	295	0.555 6679	0.549 3910	332	0.241 0504	0.238 3277	186
12	0.790 2552	0.795 5259	284	0.543 0716	0.536 7103	332	0.235 5866	0.232 8274	186
13	0.800 7357	0.805 8843	274	0.530 3076	0.523 8637	332	0.230 0502	0.227 2551	186
14	+0.810 9712	+0.815 9959	+ 264	−0.517 3794	−0.510 8553	+ 332	−0.224 4425	−0.221 6126	+ 186
15	+0.820 9581	+0.825 8575	+ 254	−0.504 2915	−0.497 6883	+ 331	−0.218 7655	−0.215 9014	+ 186

FOR GREENWICH MEAN NOON AND MIDNIGHT.

Date.	X True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Y True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Z True Equinox.		Reduc. to Mean Eq'x of Jan. 0.
	Noon.	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*
Feb. 15	+0.820 9581	+0.825 8575	+ 254	−0.504 2915	−0.497 6883	+ 331	−0.218 7655	−0.215 9014	+ 186
16	0.830 6936	0.835 4662	244	0.491 0464	0.484 3667	331	0.213 0206	0.210 1232	186
17	0.840 1746	0.844 8184	234	0.477 6496	0.470 8955	330	0.207 2096	0.204 2799	185
18	0.849 3972	0.853 9109	224	0.464 1049	0.457 2785	330	0.201 3344	0.198 3733	184
19	0.858 3589	0.862 7408	215	0.450 4167	0.443 5202	329	0.195 3969	0.192 4054	183
20	+0.867 0563	+0.871 3051	+ 205	−0.436 5895	−0.429 6253	+ 329	−0.189 3990	−0.186 3780	+ 182
21	0.875 4869	0.879 6013	196	0.422 6281	0.415 5985	328	0.183 3426	0.180 2932	181
22	0.883 6481	0.887 6270	187	0.408 5372	0.401 4447	327	0.177 2300	0.174 1532	180
23	0.891 5378	0.895 3800	178	0.394 3217	0.387 1687	326	0.171 0630	0.167 9598	179
24	0.899 1534	0.902 8580	169	0.379 9864	0.372 7753	325	0.164 8439	0.161 7155	178
25	+0.906 4934	+0.910 0593	+ 161	−0.365 5360	−0.358 2692	+ 324	−0.158 5748	−0.155 4222	+ 176
26	0.913 5556	0.916 9823	152	0.350 9754	0.343 6553	323	0.152 2578	0.149 0819	175
27	0.920 3390	0.923 6255	144	0.336 3093	0.328 9381	321	0.145 8948	0.142 6968	173
28	0.926 8416	0.929 9873	136	0.321 5422	0.314 1223	319	0.139 4882	0.136 2690	171
Mar. 1	0.933 0623	0.936 0665	128	0.306 6789	0.299 2124	317	0.133 0396	0.129 8003	169
2	+0.938 9996	+0.941 8614	+ 120	−0.291 7236	−0.284 2130	+ 315	−0.126 5513	−0.123 2929	+ 167
3	0.944 6520	0.947 3712	112	0.276 6812	0.269 1286	313	0.120 0253	0.116 7486	165
4	0.950 0189	0.952 5948	104	0.261 5559	0.253 9636	311	0.113 4632	0.110 1695	163
5	0.955 0987	0.957 5306	97	0.246 3522	0.238 7224	309	0.106 8675	0.103 5574	160
6	0.959 8902	0.962 1775	90	0.231 0746	0.223 4094	307	0.100 2396	0.096 9143	158
7	+0.964 3924	+0.966 5348	+ 83	−0.215 7274	−0.208 0290	+ 304	−0.093 5818	−0.090 2422	+ 155
8	0.968 6045	0.970 6014	76	0.200 3150	0.192 5859	302	0.086 8959	0.083 5430	153
9	0.972 5253	0.974 3759	69	0.184 8423	0.177 0846	299	0.080 1839	0.076 8187	150
10	0.976 1533	0.977 8575	62	0.169 3133	0.161 5291	297	0.073 4476	0.070 0709	147
11	0.979 4883	0.981 0456	56	0.153 7325	0.145 9241	294	0.066 6889	0.063 3018	144
12	+0.982 5292	+0.983 9390	+ 49	−0.138 1044	−0.130 2741	+ 291	−0.059 9098	−0.056 5132	+ 141
13	0.985 2750	0.986 5370	43	0.122 4337	0.114 5837	288	0.053 1123	0.049 7072	138
14	0.987 7249	0.988 8387	37	0.106 7248	0.098 8575	285	0.046 2982	0.042 8856	135
15	0.989 8782	0.990 8433	31	0.090 9823	0.083 0999	282	0.039 4697	0.036 0505	132
16	0.991 7339	0.992 5500	25	0.075 2109	0.067 3159	279	0.032 6285	0.029 2039	129
17	+0.993 2914	+0.993 9581	+ 20	−0.059 4154	−0.051 5100	+ 276	−0.025 7769	−0.022 3477	+ 126
18	0.994 5500	0.995 0671	14	0.043 6004	0.035 6875	273	0.018 9167	0.015 4842	123
19	0.995 5094	0.995 8767	9	0.027 7717	0.019 8534	269	0.012 0503	0.008 6153	120
20	0.996 1690	0.996 3864	+ 4	−0.011 9334	−0.004 0125	266	−0.005 1796	−0.001 7434	117
21	0.996 5288	0.996 5962	− 1	+0.003 9088	+0.011 8299	262	+0.001 6929	+0.005 1292	113
22	+0.996 5887	+0.996 5063	− 6	+0.019 7501	+0.027 6687	+ 259	+0.008 5652	+0.012 0006	+ 110
23	0.996 3491	0.996 1170	10	0.035 5850	0.043 4986	255	0.015 4349	0.018 8682	106
24	0.995 8103	0.995 4290	15	0.051 4086	0.059 3144	252	0.022 2998	0.025 7297	103
25	0.994 9733	0.994 4434	19	0.067 2155	0.075 1114	248	0.029 1576	0.032 5832	99
26	0.993 8391	0.993 1604	23	0.083 0013	0.090 8846	244	0.036 0063	0.039 4265	96
27	+0.992 4076	+0.991 5810	− 27	+0.098 7608	+0.106 6292	+ 240	+0.042 8436	+0.046 2574	+ 92
28	0.990 6807	0.989 7070	31	0.114 4893	0.122 3406	236	0.049 6676	0.053 0740	88
29	0.988 6599	0.987 5394	35	0.130 1825	0.138 0144	232	0.056 4762	0.059 8740	84
30	0.986 3457	0.985 0790	39	0.145 8357	0.153 6458	228	0.063 2672	0.066 6556	81
31	0.983 7395	0.982 3274	42	0.161 4443	0.169 2307	224	0.070 0390	0.073 4170	77
Apr. 1	+0.980 8428	+0.979 2858	− 45	+0.177 0044	+0.184 7646	+ 220	+0.076 7894	+0.080 1560	+ 73
2	+0.977 6567	+0.975 9555	− 48	+0.192 5111	+0.200 2432	+ 215	+0.083 5166	+0.086 8709	+ 69

FOR GREENWICH MEAN NOON AND MIDNIGHT.

Date.	X True Equinox.		Reduc. to Mean Eq'x of Jan. o.	Y True Equinox.		Reduc. to Mean Eq'x of Jan. o.	Z True Equinox.		Reduc. to Mean Eq'x of Jan. o.
	Noon.	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*
Apr. 1	+0.980 8428	+0.979 2858	−45	+0.177 0044	+0.184 7646	+220	+0.076 7894	+0.080 1560	+73
2	0.977 6567	0.975 9555	48	0.192 5111	0.200 2432	215	0.083 5166	0.086 8709	69
3	0.974 1825	0.972 3378	51	0.207 9603	0.215 6619	211	0.090 2187	0.093 5597	65
4	0.970 4216	0.968 4342	53	0.223 3476	0.231 0168	206	0.096 8938	0.100 2208	61
5	0.966 3756	0.964 2460	56	0.238 6691	0.246 3038	201	0.103 5404	0.106 8522	57
6	+0.962 0456	+0.959 7746	−58	+0.253 9204	+0.261 5184	+196	+0.110 1562	+0.113 4522	+53
7	0.957 4332	0.955 0216	60	0.269 0974	0.276 6568	192	0.116 7398	0.120 0188	49
8	0.952 5399	0.949 9884	62	0.284 1958	0.291 7144	187	0.123 2891	0.126 5504	45
9	0.947 3673	0.944 6766	64	0.299 2119	0.306 6876	182	0.129 8025	0.133 0452	41
10	0.941 9166	0.939 0875	65	0.314 1410	0.321 5718	177	0.136 2783	0.139 5014	37
11	+0.936 1896	+0.933 2230	−66	+0.328 9793	+0.336 3629	+173	+0.142 7144	+0.145 9173	+33
12	0.930 1878	0.927 0843	67	0.343 7222	0.351 0567	168	0.149 1096	0.152 2911	29
13	0.923 9127	0.920 6732	68	0.358 3659	0.365 6491	163	0.155 4616	0.158 6208	25
14	0.917 3661	0.913 9915	68	0.372 9059	0.380 1357	158	0.161 7686	0.164 9048	22
15	0.910 5497	0.907 0408	68	0.387 3380	0.394 5122	153	0.168 0291	0.171 1412	18
16	+0.903 4653	+0.899 8234	−68	+0.401 6577	+0.408 7739	+148	+0.174 2409	+0.177 3280	+14
17	0.896 1154	0.892 3414	68	0.415 8606	0.422 9169	143	0.180 4022	0.183 4633	10
18	0.888 5017	0.884 5967	68	0.429 9423	0.436 9362	138	0.186 5111	0.189 5453	7
19	0.880 6267	0.876 5921	67	0.443 8982	0.450 8277	133	0.192 5656	0.195 5719	+ 3
20	0.872 4931	0.868 3301	66	0.457 7241	0.464 5869	127	0.198 5639	0.201 5413	− 1
21	+0.864 1036	+0.859 8139	−65	+0.471 4156	+0.478 2097	+122	+0.204 5040	+0.207 4516	− 5
22	0.855 4613	0.851 0463	64	0.484 9686	0.491 6919	117	0.210 3840	0.213 3010	8
23	0.846 5693	0.842 0306	63	0.498 3790	0.505 0295	112	0.216 2022	0.219 0876	12
24	0.837 4307	0.832 7700	61	0.511 6429	0.518 2188	107	0.221 9569	0.224 8099	15
25	0.828 0488	0.823 2677	59	0.524 7567	0.531 2561	102	0.227 6465	0.230 4663	18
26	+0.818 4269	+0.813 5271	−57	+0.537 7167	+0.544 1380	+ 97	+0.233 2693	+0.236 0551	−21
27	0.808 5684	0.803 5513	55	0.550 5195	0.556 8608	92	0.238 8237	0.241 5749	25
28	0.798 4762	0.793 3436	52	0.563 1615	0.569 4214	87	0.244 3084	0.247 0241	28
29	0.788 1539	0.782 9075	50	0.575 6397	0.581 8164	82	0.249 7218	0.252 4013	31
30	0.777 6049	0.772 2464	47	0.587 9507	0.594 0425	77	0.255 0625	0.257 7052	34
May 1	+0.766 8324	+0.761 3634	−44	+0.600 0914	+0.606 0968	+ 72	+0.260 3292	+0.262 9344	−37
2	0.755 8397	0.750 2619	40	0.612 0585	0.617 9762	67	0.265 5205	0.268 0875	40
3	0.744 6304	0.738 9455	36	0.623 8493	0.629 6774	62	0.270 6351	0.273 1632	43
4	0.733 2076	0.727 4170	32	0.635 4602	0.641 1976	58	0.275 6717	0.278 1603	46
5	0.721 5742	0.715 6800	28	0.646 8891	0.652 5341	53	0.280 6290	0.283 0775	49
6	+0.709 7345	+0.703 7380	−23	+0.658 1324	+0.663 6836	+ 49	+0.285 5058	+0.287 9136	−52
7	0.697 6910	0.691 5940	19	0.669 1873	0.674 6433	44	0.290 3008	0.292 6672	55
8	0.685 4473	0.679 2515	14	0.680 0512	0.685 4105	40	0.295 0127	0.297 3373	58
9	0.673 0070	0.666 7140	9	0.690 7210	0.695 9822	35	0.299 6407	0.301 9227	61
10	0.660 3730	0.653 9845	− 3	0.701 1938	0.706 3554	31	0.304 1832	0.306 4221	63
11	+0.647 5488	+0.641 0664	+ 2	+0.711 4666	+0.716 5271	+ 27	+0.308 6391	+0.310 8341	−66
12	0.634 5378	0.627 9634	8	0.721 5366	0.726 4946	23	0.313 0070	0.315 1576	68
13	0.621 3436	0.614 6789	14	0.731 4007	0.736 2546	19	0.317 2858	0.319 3914	71
14	0.607 9698	0.601 2168	20	0.741 0560	0.745 8044	15	0.321 4743	0.323 5342	73
15	0.594 4203	0.587 5808	26	0.750 4995	0.755 1408	11	0.325 5709	0.327 5844	75
16	+0.580 6989	+0.573 7749	+33	+0.759 7281	+0.764 2610	+ 8	+0.329 5746	+0.331 5412	−77
17	+0.566 8095	+0.559 8032	+39	+0.768 7390	+0.773 1619	+ 5	+0.333 4840	+0.335 4030	−79

FOR GREENWICH MEAN NOON AND MIDNIGHT.

Date.	X True Equinox.		Reduc. to Mean Eq'x of Jan. o.	Y True Equinox.		Reduc. to Mean Eq'x of Jan. o.	Z True Equinox.		Reduc. to Mean Eq'x of Jan. o.
	Noon.	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*
May 17	+0.566 8095	+0.559 8032	+ 39	+0.768 7389	+0.773 1619	+ 5	+0.333 4840	+0.335 4030	− 79
18	0.552 7565	0.545 6700	46	0.777 5294	0.781 8410	+ 2	0.337 2979	0.339 1686	81
19	0.538 5443	0.531 3800	53	0.786 0964	0.790 2955	− 1	0.341 0149	0.342 8368	83
20	0.524 1775	0.516 9374	60	0.794 4378	0.798 5231	4	0.344 6342	0.346 4068	84
21	0.509 6603	0.502 3469	67	0.802 5510	0.806 5213	7	0.348 1545	0.349 8772	86
22	+0.494 9977	+0.487 6134	+ 75	+0.810 4338	+0.814 2881	− 9	+0.351 5748	+0.353 2472	− 87
23	0.480 1944	0.472 7413	82	0.818 0841	0.821 8214	11	0.354 8942	0.356 5158	89
24	0.465 2547	0.457 7353	90	0.825 5000	0.829 1196	13	0.358 1118	0.359 6822	90
25	0.450 1835	0.442 6000	98	0.832 6799	0.836 1807	15	0.361 2269	0.362 7457	91
26	0.434 9853	0.427 3400	106	0.839 6219	0.843 0031	16	0.364 2386	0.365 7055	92
27	+0.419 6647	+0.411 9599	+ 114	+0.846 3243	+0.849 5852	− 18	+0.367 1463	+0.368 5610	− 93
28	0.404 2262	0.396 4642	122	0.852 7858	0.855 9257	19	0.369 9494	0.371 3115	94
29	0.388 6743	0.380 8571	131	0.859 0049	0.862 0232	20	0.372 6472	0.373 9564	95
30	0.373 0133	0.365 1435	140	0.864 9804	0.867 8761	21	0.375 2391	0.376 4950	96
31	0.357 2481	0.349 3276	149	0.870 7104	0.873 4831	21	0.377 7243	0.378 9269	97
June 1	+0.341 3827	+0.333 4139	+ 159	+0.876 1941	+0.878 8432	− 21	+0.380 1027	+0.381 2516	− 97
2	0.325 4218	0.317 4068	168	0.881 4303	0.883 9552	21	0.382 3736	0.383 4686	97
3	0.309 3695	0.301 3106	177	0.886 4177	0.888 8179	20	0.384 5365	0.385 5773	97
4	0.293 2304	0.285 1294	186	0.891 1555	0.893 4303	19	0.386 5910	0.387 5774	97
5	0.277 0083	0.268 8675	195	0.895 6422	0.897 7911	18	0.388 5366	0.389 4685	97
6	+0.260 7077	+0.252 5293	+ 204	+0.899 8768	+0.901 8991	− 17	+0.390 3730	+0.391 2500	− 97
7	0.244 3329	0.236 1190	213	0.903 8580	0.905 7533	15	0.392 0995	0.392 9214	97
8	0.227 8882	0.219 6409	222	0.907 5850	0.909 3526	14	0.393 7158	0.394 4825	97
9	0.211 3778	0.203 0993	232	0.911 0563	0.912 6958	12	0.395 2215	0.395 9325	96
10	0.194 8061	0.186 4989	241	0.914 2709	0.915 7815	10	0.396 6157	0.397 2711	96
11	+0.178 1780	+0.169 8439	+ 251	+0.917 2275	+0.918 6088	− 8	+0.397 8989	+0.398 4978	− 95
12	0.161 4973	0.153 1390	260	0.919 9251	0.921 1763	5	0.399 0688	0.399 6118	94
13	0.144 7695	0.136 3895	270	0.922 3624	0.923 4833	− 2	0.400 1265	0.400 6130	93
14	0.127 9994	0.119 5998	279	0.924 5388	0.925 5288	+ 1	0.401 0711	0.401 5009	92
15	0.111 1915	0.102 7750	289	0.926 4531	0.927 3118	4	0.401 9023	0.402 2752	91
16	+0.094 3511	+0.085 9203	+ 298	+0.928 1046	+0.928 8317	+ 8	+0.402 6196	+0.402 9354	− 90
17	0.077 4834	0.069 0410	307	0.929 4930	0.930 0883	12	0.403 2226	0.403 4812	88
18	0.060 5937	0.052 1421	316	0.930 6176	0.931 0809	16	0.403 7112	0.403 9126	87
19	0.043 6868	0.035 2286	325	0.931 4782	0.931 8094	21	0.404 0854	0.404 2293	85
20	0.026 7681	0.018 3059	334	0.932 0747	0.932 2740	26	0.404 3447	0.404 4314	83
21	+0.009 8426	+0.001 3789	+ 343	+0.932 4073	+0.932 4747	+ 31	+0.404 4896	+0.404 5190	− 81
22	−0.007 0846	−0.015 5473	352	0.932 4762	0.932 4117	36	0.404 5198	0.404 4920	79
23	0.024 0085	0.032 4677	361	0.932 2814	0.932 0853	42	0.404 4355	0.404 3505	77
24	0.040 9243	0.049 3776	370	0.931 8235	0.931 4961	48	0.404 2370	0.404 0950	75
25	0.057 8271	0.066 2722	378	0.931 1030	0.930 6444	55	0.403 9244	0.403 7254	72
26	−0.074 7122	−0.083 1466	+ 387	+0.930 1202	+0.929 5306	+ 62	+0.403 4979	+0.403 2420	− 70
27	0.091 5748	0.099 9961	395	0.928 8758	0.928 1556	69	0.402 9577	0.402 6451	67
28	0.108 4101	0.116 8162	403	0.927 3702	0.926 5198	76	0.402 3042	0.401 9351	65
29	0.125 2139	0.133 6024	411	0.925 6045	0.924 6242	83	0.401 5377	0.401 1122	62
30	0.141 9812	0.150 3499	419	0.923 5792	0.922 4694	90	0.400 6585	0.400 1768	60
July 1	−0.158 7080	−0.167 0549	+ 426	+0.921 2951	+0.920 0563	+ 98	+0.399 6670	+0.399 1293	− 57
2	−0.175 3899	−0.183 7122	+ 434	+0.918 7531	+0.917 3856	+ 106	+0.398 5636	+0.397 9701	− 54

FOR GREENWICH MEAN NOON AND MIDNIGHT.

Date.	X True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Y True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Z True Equinox.		Reduc. to Mean Eq'x of Jan. 0.
	Noon.	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*
July 1	−0.158 7080	−0.167 0549	+ 426	+0.921 2951	+0.920 0563	+ 98	+0.399 6670	+0.399 1293	− 57
2	0.175 3899	0.183 7122	434	0.918 7531	0.917 3856	106	0.398 5636	0.397 9701	54
3	0.192 0214	0.200 3173	441	0.915 9538	0.914 4580	114	0.397 3487	0.396 6995	51
4	0.208 5994	0.216 8671	448	0.912 8982	0.911 2745	122	0.396 0225	0.395 3179	48
5	0.225 1197	0.233 3567	455	0.909 5870	0.907 8358	131	0.394 5856	0.393 8257	44
6	−0.241 5776	−0.249 7819	+ 462	+0.906 0209	+0.904 1424	+ 140	+0.393 0383	+0.392 2233	− 41
7	0.257 9690	0.266 1383	468	0.902 2004	0.900 1951	149	0.391 3808	0.390 5109	37
8	0.274 2893	0.282 4215	474	0.898 1265	0.895 9947	158	0.389 6136	0.388 6889	33
9	0.290 5343	0.298 6271	480	0.893 7998	0.891 5419	168	0.387 7369	0.386 7575	29
10	0.306 6992	0.314 7501	486	0.889 2211	0.886 8377	178	0.385 7509	0.384 7172	25
11	−0.322 7793	−0.330 7861	+ 492	+0.884 3916	+0.881 8829	+ 188	+0.383 6564	+0.382 5685	− 21
12	0.338 7700	0.346 7303	497	0.879 3118	0.876 6786	198	0.381 4535	0.380 3116	17
13	0.354 6664	0.362 5777	502	0.873 9834	0.871 2262	209	0.379 1427	0.377 9470	13
14	0.370 4636	0.378 3236	506	0.868 4073	0.865 5269	219	0.376 7246	0.375 4755	9
15	0.386 1570	0.393 9632	510	0.862 5852	0.859 5822	230	0.374 1997	0.372 8973	− 4
16	−0.401 7415	−0.409 4915	+ 514	+0.856 5183	+0.853 3937	+ 241	+0.371 5685	+0.370 2134	0
17	0.417 2125	0.424 9039	518	0.850 2086	0.846 9632	252	0.368 8321	0.367 4246	+ 5
18	0.432 5652	0.440 1957	522	0.843 6579	0.840 2928	263	0.365 9910	0.364 5314	9
19	0.447 7949	0.455 3623	525	0.836 8683	0.833 3845	275	0.363 0460	0.361 5349	14
20	0.462 8973	0.470 3992	528	0.829 8418	0.826 2405	286	0.359 9982	0.358 4360	18
21	−0.477 8677	−0.485 3023	+ 531	+0.822 5808	+0.818 8630	+ 298	+0.356 8485	+0.355 2359	+ 23
22	0.492 7022	0.500 0667	533	0.815 0874	0.811 2542	310	0.353 5981	0.351 9351	28
23	0.507 3955	0.514 6882	535	0.807 3638	0.803 4165	322	0.350 2472	0.348 5347	33
24	0.521 9444	0.529 1635	537	0.799 4126	0.795 3524	334	0.346 7976	0.345 0361	38
25	0.536 3449	0.543 4878	538	0.791 2362	0.787 0642	346	0.343 2503	0.341 4402	43
26	−0.550 5920	−0.557 6572	+ 539	+0.782 8368	+0.778 5546	+ 358	+0.339 6061	+0.337 7481	+ 48
27	0.564 6828	0.571 6682	539	0.774 2177	0.769 8263	370	0.335 8664	0.333 9610	54
28	0.578 6130	0.585 5167	539	0.765 3807	0.760 8814	382	0.332 0322	0.330 0800	59
29	0.592 3789	0.599 1992	539	0.756 3286	0.751 7228	394	0.328 1047	0.326 1063	65
30	0.605 9772	0.612 7123	538	0.747 0642	0.742 3532	407	0.324 0851	0.322 0412	71
31	−0.619 4042	−0.626 0524	+ 537	+0.737 5900	+0.732 7749	+ 419	+0.319 9746	+0.317 8855	+ 77
Aug. 1	0.632 6564	0.639 2159	536	0.727 9082	0.722 9905	431	0.315 7741	0.313 6406	82
2	0.645 7304	0.652 1995	534	0.718 0219	0.713 0027	443	0.311 4851	0.309 3075	88
3	0.658 6228	0.664 9998	532	0.707 9332	0.702 8137	455	0.307 1082	0.304 8873	94
4	0.671 3301	0.677 6135	530	0.697 6445	0.692 4259	467	0.302 6449	0.300 3811	100
5	−0.683 8493	−0.690 0369	+ 527	+0.687 1583	+0.681 8420	+ 479	+0.298 0961	+0.295 7899	+ 105
6	0.696 1759	0.702 2661	524	0.676 4773	0.671 0644	491	0.293 4628	0.291 1149	111
7	0.708 3068	0.714 2976	521	0.665 6036	0.660 0955	503	0.288 7463	0.286 3571	117
8	0.720 2381	0.726 1277	517	0.654 5402	0.648 9381	515	0.283 9474	0.281 5176	123
9	0.731 9660	0.737 7527	513	0.643 2896	0.637 5952	527	0.279 0676	0.276 5977	129
10	−0.743 4871	−0.749 1687	+ 508	+0.631 8551	+0.626 0697	+ 539	+0.274 1079	+0.271 5985	+ 135
11	0.754 7972	0.760 3720	503	0.620 2394	0.614 3646	551	0.269 0696	0.266 5214	141
12	0.765 8928	0.771 3590	498	0.608 4457	0.602 4833	562	0.263 9541	0.261 3679	147
13	0.776 7701	0.782 1258	493	0.596 4776	0.590 4291	574	0.258 7629	0.256 1392	153
14	0.787 4258	0.792 6694	487	0.584 3382	0.578 2054	586	0.253 4972	0.250 8370	159
15	−0.797 8563	−0.802 9860	+ 481	+0.572 0312	+0.565 8161	+ 598	+0.248 1588	+0.245 4627	+ 165
16	−0.808 0581	−0.813 0724	+ 474	+0.559 5604	+0.553 2646	+ 609	+0.242 7490	+0.240 0180	+ 172

FOR GREENWICH MEAN NOON AND MIDNIGHT.

Date.	X True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Y True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Z True Equinox.		Reduc. to Mean Eq'x of Jan. 0.
	Noon.	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*
Aug. 16	−0.808 0581	−0.813 0724	+ 474	+0.559 5604	+0.553 2646	+ 609	+0.242 7490	+0.240 0180	+ 172
17	0.818 0284	0.822 9256	467	0.546 9292	0.540 5548	621	0.237 2697	0.234 5043	178
18	0.827 7638	0.832 5425	460	0.534 1417	0.527 6904	632	0.231 7222	0.228 9236	184
19	0.837 2614	0.841 9201	452	0.521 2015	0.514 6754	643	0.226 1087	0.223 2774	190
20	0.846 5183	0.851 0557	444	0.508 1127	0.501 5137	654	0.220 4301	0.217 5672	197
21	−0.855 5319	−0.859 9466	+ 436	+0.494 8790	+0.488 2091	+ 665	+0.214 6888	+0.211 7951	+ 203
22	0.864 2995	0.868 5902	427	0.481 5044	0.474 7656	675	0.208 8863	0.205 9626	209
23	0.872 8185	0.876 9843	418	0.467 9930	0.461 1872	686	0.203 0243	0.200 0715	215
24	0.881 0871	0.885 1262	409	0.454 3486	0.447 4778	696	0.197 1045	0.194 1235	222
25	0.889 1017	0.893 0134	399	0.440 5753	0.433 6416	706	0.191 1288	0.188 1205	228
26	−0.896 8611	−0.900 6445	+ 389	+0.426 6772	+0.419 6824	+ 716	+0.185 0989	+0.182 0642	+ 234
27	0.904 3634	0.908 0174	379	0.412 6578	0.405 6042	726	0.179 0166	0.175 9563	240
28	0.911 6063	0.915 1300	368	0.398 5218	0.391 4111	735	0.172 8836	0.169 7987	246
29	0.918 5881	0.921 9805	357	0.384 2726	0.377 1068	744	0.166 7018	0.163 5930	253
30	0.925 3069	0.928 5672	346	0.369 9141	0.362 6950	753	0.160 4725	0.157 3407	259
31	−0.931 7610	−0.934 8882	+ 335	+0.355 4499	+0.348 1794	+ 762	+0.154 1977	+0.151 0437	+ 265
Sept. 1	0.937 9485	0.940 9418	323	0.340 8838	0.333 5637	771	0.147 8788	0.144 7034	271
2	0.943 8677	0.946 7259	311	0.326 2196	0.318 8518	779	0.141 5175	0.138 3214	277
3	0.949 5162	0.952 2385	299	0.311 4609	0.304 0473	787	0.135 1153	0.131 8994	283
4	0.954 8924	0.957 4778	286	0.296 6116	0.289 1541	795	0.128 6739	0.125 4391	289
5	−0.959 9944	−0.962 4418	+ 273	+0.281 6754	+0.274 1760	+ 803	+0.122 1952	+0.118 9422	+ 295
6	0.964 8198	0.967 1282	260	0.266 6564	0.259 1173	811	0.115 6804	0.112 4102	301
7	0.969 3667	0.971 5351	247	0.251 5591	0.243 9822	818	0.109 1316	0.105 8449	307
8	0.973 6333	0.975 6610	233	0.236 3872	0.228 7749	825	0.102 5504	0.099 2484	313
9	0.977 6179	0.979 5037	219	0.221 1456	0.213 4999	832	0.095 9390	0.092 6224	319
10	−0.981 3184	−0.983 0617	+ 205	+0.205 8383	+0.198 1616	+ 839	+0.089 2989	+0.085 9688	+ 325
11	0.984 7336	0.986 3337	191	0.190 4702	0.182 7647	845	0.082 6323	0.079 2897	331
12	0.987 8619	0.989 3179	177	0.175 0458	0.167 3140	851	0.075 9412	0.072 5871	337
13	0.990 7016	0.992 0130	162	0.159 5698	0.151 8140	857	0.069 2276	0.065 8630	342
14	0.993 2520	0.994 4183	147	0.144 0470	0.136 2695	863	0.062 4936	0.059 1195	348
15	−0.995 5118	−0.996 5325	+ 132	+0.128 4821	+0.120 6854	+ 868	+0.055 7410	+0.052 3585	+ 353
16	0.997 4802	0.998 3549	117	0.112 8799	0.105 0663	873	0.048 9722	0.045 5823	358
17	0.999 1564	0.999 8848	101	0.097 2451	0.089 4170	878	0.042 1891	0.038 7929	363
18	1.000 5399	1.001 1216	85	0.081 5826	0.073 7424	883	0.035 3939	0.031 9924	368
19	1.001 6300	1.002 0650	69	0.065 8970	0.058 0471	887	0.028 5887	0.025 1829	373
20	−1.002 4265	−1.002 7145	+ 53	+0.050 1933	+0.042 3361	+ 891	+0.021 7754	+0.018 3665	+ 378
21	1.002 9291	1.003 0701	36	0.034 4762	0.026 6141	895	0.014 9564	0.011 5453	383
22	1.003 1376	1.003 1316	20	0.018 7504	+0.010 8856	899	0.008 1335	+0.004 7213	388
23	1.003 0521	1.002 8992	+ 3	+0.003 0203	−0.004 8447	902	+0.001 3090	−0.002 1033	392
24	1.002 6729	1.002 3731	− 14	−0.012 7090	0.020 5721	905	−0.005 5153	0.008 9266	397
25	−1.002 0000	−1.001 5535	− 31	−0.028 4333	−0.036 2920	+ 908	−0.012 3371	−0.015 7465	+ 401
26	1.001 0337	1.000 4407	48	0.044 1478	0.052 0002	911	0.019 1547	0.022 5614	406
27	0.999 7745	0.999 0351	65	0.059 8485	0.067 6922	913	0.025 9662	0.029 3689	410
28	0.998 2227	0.997 3374	82	0.075 5309	0.083 3640	915	0.032 7694	0.036 1674	414
29	0.996 3791	0.995 3478	100	0.091 1909	0.099 0112	916	0.039 5628	0.042 9552	418
30	−0.994 2436	−0.993 0664	− 118	−0.106 8242	−0.114 6295	+ 917	−0.046 3444	−0.049 7303	+ 422
Oct. 1	−0.991 8163	−0.990 4935	− 136	−0.122 4265	−0.130 2148	+ 918	−0.053 1125	−0.056 4908	+ 425

FOR GREENWICH MEAN NOON AND MIDNIGHT.

Date.	X True Equinox.		Reduc. to Mean Eq'x of Jan. o.	Y True Equinox.		Reduc. to Mean Eq'x of Jan. o.	Z True Equinox.		Reduc. to Mean Eq'x of Jan. o.
	Noon.	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*
Oct. 1	−0.991 8163	−0.990 4935	− 136	−0.122 4265	−0.130 2148	+ 918	−0.053 1125	−0.056 4908	+ 425
2	0.989 0979	0.987 6294	154	0.137 9937	0.145 7628	919	0.059 8651	0.063 2352	429
3	0.986 0882	0.984 4745	172	0.153 5214	0.161 2691	919	0.066 6008	0.069 9615	432
4	0.982 7880	0.981 0287	190	0.169 0050	0.176 7293	919	0.073 3172	0.076 6676	435
5	0.979 1969	0.977 2927	209	0.184 4406	0.192 1386	919	0.080 0126	0.083 3519	438
6	−0.975 3160	−0.973 2668	− 227	−0.199 8227	−0.207 4925	+ 918	−0.086 6852	−0.090 0122	+ 441
7	0.971 1453	0.968 9516	246	0.215 1472	0.222 7863	917	0.093 3326	0.096 6464	444
8	0.966 6858	0.964 3478	264	0.230 4091	0.238 0149	916	0.099 9531	0.103 2525	447
9	0.961 9379	0.959 4564	283	0.245 6033	0.253 1737	915	0.106 5444	0.109 8285	450
10	0.956 9032	0.954 2783	302	0.260 7255	0.268 2580	914	0.113 1045	0.116 3723	453
11	−0.951 5822	−0.948 8149	− 321	−0.275 7707	−0.283 2628	+ 912	−0.119 6315	−0.122 8818	+ 455
12	0.945 9765	0.943 0673	340	0.290 7339	0.298 1833	910	0.126 1229	0.129 3547	457
13	0.940 0874	0.937 0370	359	0.305 6105	0.313 0148	908	0.132 5769	0.135 7893	459
14	0.933 9164	0.930 7257	378	0.320 3956	0.327 7524	905	0.138 9915	0.142 1832	461
15	0.927 4652	0.924 1351	398	0.335 0846	0.342 3916	902	0.145 3643	0.148 5345	463
16	−0.920 7356	−0.917 2671	− 417	−0.349 6728	−0.356 9275	+ 898	−0.151 6936	−0.154 8412	+ 465
17	0.913 7298	0.910 1238	437	0.364 1553	0.371 3556	896	0.157 9770	0.161 1009	466
18	0.906 4496	0.902 7074	457	0.378 5277	0.385 6711	892	0.164 2126	0.167 3120	468
19	0.898 8974	0.895 0200	477	0.392 7853	0.399 8698	888	0.170 3986	0.173 4723	469
20	0.891 0754	0.887 0641	496	0.406 9239	0.413 9471	884	0.176 5328	0.179 5798	470
21	−0.882 9863	−0.878 8424	− 516	−0.420 9388	−0.427 8986	+ 879	−0.182 6132	−0.185 6327	+ 471
22	0.874 6326	0.870 3572	536	0.434 8260	0.441 7204	874	0.188 6381	0.191 6292	472
23	0.866 0166	0.861 6113	556	0.448 5812	0.455 4080	869	0.194 6058	0.197 5675	472
24	0.857 1416	0.852 6076	575	0.462 2004	0.468 9577	863	0.200 5141	0.203 4456	472
25	0.848 0098	0.843 3486	595	0.475 6796	0.482 3655	857	0.206 3616	0.209 2620	472
26	−0.838 6244	−0.833 8373	− 615	−0.489 0151	−0.495 6278	+ 851	−0.212 1465	−0.215 0151	+ 472
27	0.828 9878	0.824 0762	635	0.502 2032	0.508 7408	845	0.217 8674	0.220 7033	471
28	0.819 1028	0.814 0680	655	0.515 2402	0.521 7008	838	0.223 5226	0.226 3250	470
29	0.808 9721	0.803 8153	675	0.528 1223	0.534 5041	831	0.229 1104	0.231 8786	469
30	0.798 5981	0.793 3207	695	0.540 8458	0.547 1471	824	0.234 6294	0.237 3626	468
31	−0.787 9835	−0.782 5868	− 715	−0.553 4073	−0.559 6260	+ 816	−0.240 0780	−0.242 7755	+ 467
Nov. 1	0.777 1309	0.771 6161	735	0.565 8027	0.571 9369	808	0.245 4547	0.248 1155	466
2	0.766 0428	0.760 4114	755	0.578 0281	0.584 0760	800	0.250 7577	0.253 3810	464
3	0.754 7222	0.748 9755	775	0.590 0799	0.596 0395	791	0.255 9852	0.258 5703	463
4	0.743 1717	0.737 3113	795	0.601 9541	0.607 8232	782	0.261 1360	0.263 6819	461
5	−0.731 3946	−0.725 4221	− 815	−0.613 6464	−0.619 4233	+ 773	−0.266 2080	−0.268 7140	+ 459
6	0.719 3942	0.713 3111	835	0.625 1533	0.630 8358	763	0.271 1997	0.273 6648	457
7	0.707 1734	0.700 9816	855	0.636 4705	0.642 0568	753	0.276 1092	0.278 5327	455
8	0.694 7361	0.688 4372	875	0.647 5942	0.653 0824	743	0.280 9351	0.283 3160	452
9	0.682 0855	0.675 6815	895	0.658 5208	0.663 9089	733	0.285 6754	0.288 0130	449
10	−0.669 2257	−0.662 7185	− 915	−0.669 2464	−0.674 5327	+ 722	−0.290 3286	−0.292 6221	+ 446
11	0.656 1604	0.649 5518	935	0.679 7675	0.684 9502	711	0.294 8933	0.297 1419	443
12	0.642 8933	0.636 1855	954	0.690 0804	0.695 1576	699	0.299 3677	0.301 5706	439
13	0.629 4289	0.622 6240	974	0.700 1815	0.705 1516	687	0.303 7504	0.305 9069	435
14	0.615 7714	0.608 8714	993	0.710 0675	0.714 9288	675	0.308 0398	0.310 1490	431
15	−0.601 9248	−0.594 9320	− 1013	−0.719 7351	−0.724 4859	+ 662	−0.312 2343	−0.314 2956	+ 427
16	−0.587 8937	−0.580 8104	− 1032	−0.729 1809	−0.733 8197	+ 649	−0.316 3328	−0.318 3455	+ 423

FOR GREENWICH MEAN NOON AND MIDNIGHT.

Date.	X True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Y True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Z True Equinox.		Reduc. to Mean Eq'x of Jan. 0.
	Noon.	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*
Nov. 16	−0.587 8937	−0.580 8104	− 1032	−0.729 1809	−0.733 8197	+ 649	−0.316 3328	−0.318 3455	+ 423
17	0.573 6827	0.566 5111	1052	0.738 4020	0.742 9273	636	0.320 3336	0.322 2970	419
18	0.559 2962	0.552 0387	1071	0.747 3954	0.751 8058	622	0.324 2355	0.326 1489	414
19	0.544 7391	0.537 3980	1090	0.756 1583	0.760 4525	608	0.328 0372	0.329 9002	409
20	0.530 0159	0.522 5935	1109	0.764 6881	0.768 8648	594	0.331 7378	0.333 5498	404
21	−0.515 1314	−0.507 6301	− 1128	−0.772 9822	−0.777 0402	+ 579	−0.335 3360	−0.337 0964	+ 399
22	0.500 0902	0.492 5123	1146	0.781 0384	0.784 9765	564	0.338 8307	0.340 5389	393
23	0.484 8970	0.477 2449	1165	0.788 8543	0.792 6715	549	0.342 2209	0.343 8767	387
24	0.469 5565	0.461 8323	1183	0.796 4278	0.800 1230	533	0.345 5061	0.347 1089	381
25	0.454 0730	0.446 2791	1201	0.803 7568	0.807 3290	517	0.348 6850	0.350 2343	375
26	−0.438 4513	−0.430 5899	− 1219	−0.810 8394	−0.814 2877	+ 500	−0.351 7567	−0.353 2522	+ 368
27	0.422 6955	0.414 7688	1237	0.817 6736	0.820 9968	483	0.354 7206	0.356 1619	362
28	0.406 8102	0.398 8204	1254	0.824 2571	0.827 4542	466	0.357 5759	0.358 9626	355
29	0.390 7998	0.382 7490	1271	0.830 5879	0.833 6579	448	0.360 3217	0.361 6532	348
30	0.374 6686	0.366 5591	1288	0.836 6640	0.839 6059	430	0.362 9570	0.364 2329	341
Dec. 1	−0.358 4212	−0.350 2554	− 1305	−0.842 4833	−0.845 2959	+ 411	−0.365 4809	−0.366 7008	+ 334
2	0.342 0622	0.333 8422	1322	0.848 0434	0.850 7258	392	0.367 8926	0.369 0561	326
3	0.325 5962	0.317 3248	1338	0.853 3426	0.855 8936	373	0.370 1912	0.371 2978	318
4	0.309 0284	0.300 7075	1354	0.858 3786	0.860 7973	353	0.372 3757	0.373 4250	310
5	0.292 3631	0.283 9960	1370	0.863 1495	0.865 4349	333	0.374 4455	0.375 4371	302
6	−0.275 6066	−0.267 1953	− 1386	−0.867 6534	−0.869 8047	+ 312	−0.376 3996	−0.377 3330	+ 294
7	0.258 7630	0.250 3103	1402	0.871 8886	0.873 9049	291	0.378 2372	0.379 1121	286
8	0.241 8378	0.233 3463	1417	0.875 8534	0.877 7340	270	0.379 9576	0.380 7737	277
9	0.224 8365	0.216 3089	1432	0.879 5464	0.881 2904	249	0.381 5602	0.382 3171	268
10	0.207 7642	0.199 2032	1446	0.882 9658	0.884 5725	227	0.383 0442	0.383 7415	259
11	−0.190 6266	−0.182 0350	− 1460	−0.886 1103	−0.887 5792	+ 205	−0.384 4090	−0.385 0465	+ 250
12	0.173 4291	0.164 8097	1473	0.888 9789	0.890 3092	182	0.385 6541	0.386 2316	241
13	0.156 1775	0.147 5332	1486	0.891 5701	0.892 7615	159	0.386 7790	0.387 2961	232
14	0.138 8774	0.130 2110	1499	0.893 8833	0.894 9354	136	0.387 7830	0.388 2397	222
15	0.121 5346	0.112 8490	1511	0.895 9177	0.896 8301	112	0.388 6662	0.389 0622	212
16	−0.104 1548	−0.095 4528	− 1523	−0.897 6725	−0.898 4449	+ 88	−0.389 4279	−0.389 7632	+ 202
17	0.086 7437	0.078 0281	1535	0.899 1473	0.899 7796	64	0.390 0680	0.390 3424	192
18	0.069 3068	0.060 5806	1546	0.900 3419	0.900 8341	39	0.390 5864	0.390 7999	182
19	0.051 8500	0.043 1157	1557	0.901 2562	0.901 6082	+ 14	0.390 9829	0.391 1355	172
20	0.034 3785	0.025 6393	1567	0.901 8900	0.902 1020	− 11	0.391 2577	0.391 3495	161
21	−0.016 8986	−0.008 1569	− 1577	−0.902 2440	−0.902 3159	− 36	−0.391 4108	−0.391 4417	+ 151
22	+0.000 5851	+0.009 3266	1586	0.902 3177	0.902 2496	62	0.391 4423	0.391 4125	140
23	0.018 0671	0.026 8058	1595	0.902 1115	0.901 9036	88	0.391 3523	0.391 2618	129
24	0.035 5422	0.044 2756	1603	0.901 6259	0.901 2785	115	0.391 1410	0.390 9899	118
25	0.053 0054	0.061 7309	1611	0.900 8614	0.900 3745	142	0.390 8085	0.390 5970	107
26	+0.070 4516	+0.079 1668	− 1618	−0.899 8180	−0.899 1919	− 169	−0.390 3553	−0.390 0833	+ 96
27	0.087 8759	0.096 5782	1625	0.898 4962	0.897 7310	196	0.389 7812	0.389 4490	85
28	0.105 2732	0.113 9601	1631	0.896 8962	0.895 9920	223	0.389 0867	0.388 6942	73
29	0.122 6384	0.131 3074	1636	0.895 0183	0.893 9753	251	0.388 2716	0.387 8190	61
30	0.139 9665	0.148 6150	1641	0.892 8629	0.891 6813	279	0.387 3364	0.386 8238	49
31	+0.157 2522	+0.165 8776	− 1646	−0.890 4304	−0.889 1104	− 307	−0.386 2811	−0.385 7085	+ 37
32	+0.174 4906	+0.183 0904	− 1650	−0.887 7213	−0.886 2632	− 335	−0.385 1059	−0.384 4734	+ 25

FOR GREENWICH MEAN NOON AND MIDNIGHT.

Day of Month.	JANUARY.		Day of Month.	FEBRUARY.		Day of Month.	MARCH.	
	True Longitude.	Latitude.		True Longitude.	Latitude.		True Longitude.	Latitude.
	° ′ ″	° ′ ″		° ′ ″	° ′ ″		° ′ ″	° ′ ″
1.0	39 25 33.7	−3 49 46.8	1.0	88 40 18.8	+0 19 1.8	1.0	98 15 13.1	+1 21 0.4
1.5	46 10 30.8	3 22 37.2	1.5	94 56 1.3	0 52 35.7	1.5	104 25 33.8	1 51 54.9
2.0	52 52 6.8	2 52 54.0	2.0	101 9 1.9	1 25 14.9	2.0	110 32 55.8	2 21 14.5
2.5	59 30 24.6	2 21 5.1	2.5	107 19 36.4	1 56 38.3	2.5	116 37 47.0	2 48 42.8
3.0	66 5 27.2	1 47 39.1	3.0	113 27 59.0	2 26 26.1	3.0	122 40 32.6	3 14 4.9
3.5	72 37 17.7	−1 13 5.0	3.5	119 34 22.0	+2 54 20.1	3.5	128 41 35.3	+3 37 7.3
4.0	79 5 59.3	0 37 51.5	4.0	125 38 56.5	3 20 3.9	4.0	134 41 15.1	3 57 37.6
4.5	85 31 34.9	−0 2 26.8	4.5	131 41 52.2	3 43 22.7	4.5	140 39 49.6	4 15 25.0
5.0	91 54 7.6	+0 32 41.7	5.0	137 43 18.2	4 4 3.5	5.0	146 37 33.8	4 30 20.1
5.5	98 13 40.5	1 7 8.0	5.5	143 43 23.4	4 21 55.2	5.5	152 34 40.8	4 42 15.1
6.0	104 30 17.3	+1 40 27.7	6.0	149 42 16.9	+4 36 48.6	6.0	158 31 22.1	+4 51 3.5
6.5	110 44 2.7	2 12 18.3	6.5	155 40 8.5	4 48 36.3	6.5	164 27 47.8	4 56 40.6
7.0	116 55 2.5	2 42 19.4	7.0	161 37 8.9	4 57 12.9	7.0	170 24 7.2	4 59 3.4
7.5	123 3 23.7	3 10 13.0	7.5	167 33 30.3	5 2 34.8	7.5	176 20 29.7	4 58 10.6
8.0	129 9 15.2	3 35 43.0	8.0	173 29 26.9	5 4 39.7	8.0	182 17 4.9	4 54 2.4
8.5	135 12 47.8	+3 58 35.8	8.5	179 25 15.3	+5 3 26.9	8.5	188 14 3.2	+4 46 40.9
9.0	141 14 14.7	4 18 40.1	9.0	185 21 14.4	4 58 57.3	9.0	194 11 36.3	4 36 9.8
9.5	147 13 51.4	4 35 46.5	9.5	191 17 45.5	4 51 13.2	9.5	200 9 57.5	4 22 34.3
10.0	153 11 55.9	4 49 47.6	10.0	197 15 12.9	4 40 17.8	10.0	206 9 22.4	4 6 1.2
10.5	159 8 48.7	5 0 37.5	10.5	203 14 3.5	4 26 15.6	10.5	212 10 9.0	3 46 38.8
11.0	165 4 53.1	+5 8 11.9	11.0	209 14 46.9	+4 9 12.0	11.0	218 12 38.0	+3 24 36.6
11.5	171 0 34.9	5 12 27.7	11.5	215 17 55.0	3 49 13.7	11.5	224 17 12.6	3 0 5.7
12.0	176 56 22.3	5 13 23.1	12.0	221 24 1.7	3 26 28.7	12.0	230 24 18.8	2 33 18.5
12.5	182 52 45.5	5 10 57.2	12.5	227 33 42.3	3 1 6.4	12.5	236 34 25.0	2 4 29.0
13.0	188 50 16.9	5 5 9.8	13.0	233 47 33.2	2 33 17.8	13.0	242 48 1.8	1 33 52.6
13.5	194 49 30.3	+4 56 1.9	13.5	240 6 11.0	+2 3 16.0	13.5	249 5 41.2	+1 1 46.6
14.0	200 51 0.9	4 43 35.2	14.0	246 30 11.6	1 31 16.5	14.0	255 27 56.3	+0 28 30.1
14.5	206 55 24.9	4 27 52.5	14.5	253 0 9.0	0 57 37.3	14.5	261 55 20.2	−0 5 35.7
15.0	213 3 18.3	4 8 57.7	15.0	259 36 33.7	+0 22 39.6	15.0	268 28 24.8	0 40 7.0
15.5	219 15 16.7	3 46 56.5	15.5	266 19 51.6	−0 13 11.6	15.5	275 7 39.5	1 14 37.7
16.0	225 31 54.6	+3 21 56.3	16.0	273 10 22.3	−0 49 27.9	16.0	281 53 29.7	−1 48 39.0
16.5	231 53 44.5	2 54 6.8	16.5	280 8 16.5	1 25 36.9	16.5	288 46 15.1	2 21 39.4
17.0	238 21 15.8	2 23 40.6	17.0	287 13 34.7	2 1 2.6	17.0	295 46 7.6	2 53 5.3
17.5	244 54 53.6	1 50 53.5	17.5	294 26 5.7	2 35 6.1	17.5	302 53 9.3	3 22 21.1
18.0	251 34 57.3	1 16 5.4	18.0	301 45 24.8	3 7 6.3	18.0	310 7 10.6	3 48 50.3
18.5	258 21 39.5	+0 39 40.1	18.5	309 10 53.2	−3 36 21.6	18.5	317 27 48.7	−4 11 56.5
19.0	265 15 4.9	+0 2 6.0	19.0	316 41 38.2	4 2 11.4	19.0	324 54 26.7	4 31 5.2
19.5	272 15 8.9	−0 36 3.9	19.5	324 16 34.3	4 23 58.3	19.5	332 26 13.4	4 45 45.1
20.0	279 21 36.6	1 14 12.8	20.0	331 54 25.0	4 41 10.1	20.0	340 2 4.1	4 55 30.6
20.5	286 34 2.3	1 51 40.4	20.5	339 33 46.2	4 53 21.8	20.5	347 40 42.8	5 0 3.2
21.0	293 51 49.5	−2 27 44.0	21.0	347 13 10.1	−5 0 17.3	21.0	355 20 45.2	−4 59 13.0
21.5	301 14 11.3	3 1 40.0	21.5	354 51 9.1	5 1 49.6	21.5	3 0 42.3	4 52 59.5
22.0	308 40 11.6	3 32 46.2	22.0	2 26 19.9	4 58 1.3	22.0	10 39 4.8	4 41 32.0
22.5	316 8 46.8	4 0 22.9	22.5	9 57 27.9	4 49 4.1	22.5	18 14 27.7	4 25 8.9
23.0	323 38 48.6	4 23 55.0	23.0	17 23 29.8	4 35 17.6	23.0	25 45 34.0	4 4 16.5
23.5	331 9 6.3	−4 42 54.1	23.5	24 43 35.3	−4 17 7.7	23.5	33 11 17.7	−3 39 27.3
24.0	338 38 30.2	4 56 59.3	24.0	31 57 8.0	3 55 4.4	24.0	40 30 46.3	3 11 18.1
24.5	346 5 54.6	5 5 57.7	24.5	39 3 45.7	3 29 40.5	24.5	47 43 21.4	2 40 28.0
25.0	353 30 20.2	5 9 44.5	25.0	46 3 19.0	3 1 30.2	25.0	54 48 39.0	2 7 3.3
25.5	0 50 56.0	5 8 23.1	25.5	52 55 50.2	2 31 7.6	25.5	61 46 28.6	1 33 21.2
26.0	8 7 0.9	−5 2 3.6	26.0	59 41 31.0	−1 59 5.7	26.0	68 35 51.9	−0 58 18.9
26.5	15 18 4.4	4 51 2.1	26.5	66 20 40.8	1 25 55.7	26.5	75 20 1.0	−0 23 2.6
27.0	22 23 46.1	4 35 39.5	27.0	72 53 44.8	0 52 7.1	27.0	81 56 16.1	+0 11 57.8
27.5	29 23 55.3	4 16 20.0	27.5	79 21 12.1	−0 18 7.3	27.5	88 26 3.9	0 46 15.6
28.0	36 18 30.2	3 53 30.3	28.0	85 43 34.3	+0 15 38.9	28.0	94 49 55.8	1 19 27.4
28.5	43 7 36.3	−3 27 38.2	28.5	92 1 23.8	+0 48 48.6	28.5	101 8 26.3	+1 51 12.7
29.0	49 51 24.7	2 59 12.3	29.0	98 15 13.1	1 21 0.4	29.0	107 22 11.7	2 21 13.7
29.5	56 30 11.2	2 28 41.5	29.5	104 25 33.8	1 51 54.9	29.5	113 31 48.8	2 49 14.7
30.0	63 4 14.7	1 56 34.1	30.0	110 32 55.8	2 21 14.5	30.0	119 37 53.7	3 15 2.0
30.5	69 33 55.8	1 23 17.7	30.5	116 37 47.0	2 48 42.8	30.5	125 41 1.5	3 38 23.6
31.0	75 59 36.0	−0 49 19.1	31.0	122 40 32.6	+3 14 4.9	31.0	131 41 45.8	+3 59 9.1
31.5	82 21 36.8	−0 15 4.4	31.5	128 41 35.3	+3 37 7.3	31.5	137 40 38.0	+4 17 9.1

FOR GREENWICH MEAN NOON AND MIDNIGHT.

Day of Month.	APRIL.		Day of Month.	MAY.		Day of Month.	JUNE.	
	True Longitude.	Latitude.		True Longitude.	Latitude.		True Longitude.	Latitude.
	° ′ ″	° ′ ″		° ′ ″	° ′ ″		° ′ ″	° ′ ″
1.0	143 38 6.6	+4 32 15.7	1.0	175 56 32.5	+5 6 28.0	1.0	220 24 30.3	+3 7 21.7
1.5	149 34 37.8	4 44 21.7	1.5	181 53 25.5	4 59 59.0	1.5	226 36 36.6	2 38 41.2
2.0	155 30 35.1	4 53 21.4	2.0	187 51 23.2	4 50 13.1	2.0	232 52 9.0	2 7 50.1
2.5	161 26 19.1	4 59 10.2	2.5	193 50 43.9	4 37 13.7	2.5	239 11 17.4	1 35 7.0
3.0	167 22 7.6	5 1 44.7	3.0	199 51 43.5	4 21 6.1	3.0	245 34 8.8	1 0 53.1
3.5	173 18 16.2	+5 1 2.9	3.5	205 54 36.1	+4 1 57.3	3.5	252 0 46.9	+0 25 32.0
4.0	179 14 58.7	4 57 4.5	4.0	211 59 33.6	3 39 56.2	4.0	258 31 12.6	−0 10 30.1
4.5	185 12 26.8	4 49 50.6	4.5	218 6 46.0	3 15 14.1	4.5	265 5 24.1	0 46 44.8
5.0	191 10 50.9	4 39 24.1	5.0	224 16 22.1	2 48 4.3	5.0	271 43 17.1	1 22 42.1
5.5	197 10 20.6	4 25 49.7	5.5	230 28 29.5	2 18 42.4	5.5	278 24 45.1	1 57 50.5
6.0	203 11 5.1	+4 9 13.8	6.0	236 43 15.1	+1 47 26.3	6.0	285 9 39.7	−2 31 38.1
6.5	209 13 13.6	3 49 44.8	6.5	243 0 45.5	1 14 36.0	6.5	291 57 50.9	3 3 33.1
7.0	215 16 55.7	3 27 32.9	7.0	249 21 7.3	0 40 33.5	7.0	298 49 6.9	3 33 4.2
7.5	221 22 22.3	3 2 50.3	7.5	255 44 27.1	+0 5 42.7	7.5	305 43 15.0	3 59 41.8
8.0	227 29 45.6	2 35 50.8	8.0	262 10 51.9	−0 29 31.1	8.0	312 40 1.7	4 22 58.3
8.5	233 39 19.4	+2 6 49.9	8.5	268 40 29.3	−1 4 41.0	8.5	319 39 12.8	−4 42 28.9
9.0	239 51 19.5	1 36 4.9	9.0	275 13 27.2	1 39 19.2	9.0	326 40 33.0	4 57 52.0
9.5	246 6 3.6	1 3 54.7	9.5	281 49 54.0	2 12 57.1	9.5	333 43 46.6	5 8 50.1
10.0	252 23 51.4	+0 30 39.6	10.0	288 29 57.9	2 45 5.8	10.0	340 48 37.3	5 15 9.9
10.5	258 45 4.5	−0 3 18.5	10.5	295 13 46.7	3 15 16.1	10.5	347 54 47.7	5 16 42.8
11.0	265 10 5.7	−0 37 36.1	11.0	302 1 27.1	−3 42 59.4	11.0	355 1 59.7	−5 13 24.8
11.5	271 39 18.6	1 11 48.4	11.5	308 53 3.9	4 7 47.6	11.5	2 9 54.1	5 5 17.2
12.0	278 13 6.6	1 45 28.9	12.0	315 48 39.6	4 29 13.9	12.0	9 18 10.8	4 52 26.5
12.5	284 51 52.4	2 18 10.0	12.5	322 48 12.9	4 46 53.2	12.5	16 26 28.3	4 35 4.5
13.0	291 35 56.6	2 49 22.6	13.0	329 51 38.3	5 0 23.1	13.0	23 34 24.1	4 13 28.2
13.5	298 25 36.3	−3 18 36.5	13.5	336 58 45.1	−5 9 24.3	13.5	30 41 34.4	−3 47 59.1
14.0	305 21 3.7	3 45 20.9	14.0	344 9 16.9	5 13 41.2	14.0	37 47 34.7	3 19 3.2
14.5	312 22 24.3	4 9 5.0	14.5	351 22 50.9	5 13 3.0	14.5	44 52 0.0	2 47 10.3
15.0	319 29 35.6	4 29 18.5	15.0	358 38 57.7	5 7 24.4	15.0	51 54 24.8	2 12 53.6
15.5	326 42 25.6	4 45 32.6	15.5	5 57 2.0	4 56 46.2	15.5	58 54 24.1	1 36 48.4
16.0	334 0 31.7	−4 57 21.3	16.0	13 16 22.7	−4 41 16.2	16.0	65 51 33.8	−0 59 31.3
16.5	341 23 20.1	5 4 22.8	16.5	20 36 13.9	4 21 8.9	16.5	72 45 31.2	−0 21 39.1
17.0	348 50 5.7	5 6 20.7	17.0	27 55 46.5	3 56 45.0	17.0	79 35 55.5	+0 16 12.1
17.5	356 19 53.0	5 3 5.5	17.5	35 14 9.9	3 28 31.6	17.5	86 22 28.9	0 53 27.5
18.0	3 51 37.8	4 54 35.4	18.0	42 30 33.8	2 57 1.3	18.0	93 4 56.6	1 29 35.0
18.5	11 24 9.0	−4 40 57.2	18.5	49 44 9.5	−2 22 50.9	18.5	99 43 7.5	+2 4 5.4
19.0	18 56 12.3	4 22 26.4	19.0	56 54 12.1	1 46 39.8	19.0	106 16 54.6	2 36 32.8
19.5	26 26 33.4	3 59 26.3	19.5	64 0 2.2	1 9 8.6	19.5	112 46 15.0	3 6 35.2
20.0	33 54 0.9	3 32 27.5	20.0	71 1 6.5	−0 30 57.7	20.0	119 11 10.4	3 33 54.3
20.5	41 17 29.3	3 2 6.1	20.5	77 56 59.0	+0 7 14.0	20.5	125 31 46.9	3 58 15.4
21.0	48 36 2.0	−2 29 1.8	21.0	84 47 21.1	+0 44 50.3	21.0	131 48 14.9	+4 19 27.0
21.5	55 48 52.9	1 53 56.3	21.5	91 32 1.9	1 21 18.4	21.5	138 0 48.8	4 37 20.8
22.0	62 55 27.0	1 17 31.3	22.0	98 10 58.3	1 56 9.5	22.0	144 9 47.0	4 51 51.3
22.5	69 55 21.2	0 40 27.1	22.5	104 44 14.1	2 28 58.7	22.5	150 15 31.7	5 2 55.3
23.0	76 48 23.8	−0 3 20.9	23.0	111 11 59.5	2 59 25.5	23.0	156 18 27.6	5 10 31.2
23.5	83 34 33.5	+0 33 13.4	23.5	117 34 30.3	+3 27 13.1	23.5	162 19 2.5	+5 14 39.3
24.0	90 13 58.3	1 8 45.6	24.0	123 52 7.3	3 52 8.0	24.0	168 17 46.6	5 15 21.0
24.5	96 46 54.1	1 42 49.7	24.5	130 5 15.4	4 14 0.0	24.5	174 15 12.0	5 12 38.7
25.0	103 13 43.5	2 15 3.6	25.0	136 14 22.8	4 32 41.5	25.0	180 11 52.2	5 6 35.5
25.5	109 34 53.9	2 45 9.0	25.5	142 20 0.2	4 48 6.8	25.5	186 8 21.4	4 57 15.6
26.0	115 50 56.6	+3 12 50.5	26.0	148 22 40.3	+5 0 12.1	26.0	192 5 14.7	+4 44 43.8
26.5	122 2 25.4	3 37 55.5	26.5	154 22 56.8	5 8 55.1	26.5	198 3 7.3	4 29 5.6
27.0	128 9 55.8	4 0 13.7	27.0	160 21 24.0	5 14 14.5	27.0	204 2 34.1	4 10 27.6
27.5	134 14 3.9	4 19 36.7	27.5	166 18 36.4	5 16 10.1	27.5	210 4 9.0	3 48 57.3
28.0	140 15 25.6	4 35 57.7	28.0	172 15 8.2	5 14 42.4	28.0	216 8 24.8	3 24 43.6
28.5	146 14 36.2	+4 49 11.3	28.5	178 11 33.0	+5 9 52.8	28.5	222 15 52.2	+2 57 57.3
29.0	152 12 9.8	4 59 13.0	29.0	184 8 23.0	5 1 43.5	29.0	228 26 59.5	2 28 51.0
29.5	158 8 38.9	5 5 59.5	29.5	190 6 8.8	4 50 17.8	29.5	234 42 12.2	1 57 39.6
30.0	164 4 33.9	5 9 28.3	30.0	196 5 19.5	4 35 39.8	30.0	241 1 52.1	1 24 40.4
30.5	170 0 23.1	5 9 38.0	30.5	202 6 22.0	4 17 55.1	30.5	247 26 16.5	0 50 13.6
31.0	175 56 32.5	+5 6 28.0	31.0	208 9 40.5	+3 57 10.8	31.0	253 55 38.1	+0 14 42.6
31.5	181 53 25.5	+4 59 59.0	31.5	214 15 37.0	+3 33 36.0	31.5	260 30 4.5	−0 21 26.4

FOR GREENWICH MEAN NOON AND MIDNIGHT.

Day of Month.	JULY.		Day of Month.	AUGUST.		Day of Month.	SEPTEMBER.	
	True Longitude.	Latitude.		True Longitude.	Latitude.		True Longitude.	Latitude.
	° ′ ″	° ′ ″		° ′ ″	° ′ ″		° ′ ″	° ′ ″
1.0	253 55 38.1	+0 14 42.6	1.0	303 22 16.5	−3 47 22.1	1.0	356 38 37.4	−4 51 10.7
1.5	260 30 4.5	−0 21 26.4	1.5	310 36 18.3	4 11 15.8	1.5	4 13 15.2	4 38 55.7
2.0	267 9 37.4	0 57 44.4	2.0	317 54 23.2	4 31 15.9	2.0	11 45 43.5	4 21 51.2
2.5	273 54 12.2	1 33 39.7	2.5	325 15 36.7	4 46 55.0	2.5	19 14 54.4	4 0 22.2
3.0	280 43 38.1	2 8 38.9	3.0	332 38 59.1	4 57 51.2	3.0	26 39 50.2	3 34 59.5
3.5	287 37 38.6	−2 42 7.2	3.5	340 3 28.0	−5 3 49.4	3.5	33 59 44.6	−3 6 18.0
4.0	294 35 51.1	3 13 29.6	4.0	347 28 0.9	5 4 42.0	4.0	41 14 3.7	2 34 55.2
4.5	301 37 47.7	3 42 11.8	4.5	354 51 37.8	5 0 29.1	4.5	48 22 26.0	2 1 29.6
5.0	308 42 56.6	4 7 41.3	5.0	2 13 23.9	4 51 18.4	5.0	55 24 41.6	1 26 39.0
5.5	315 50 42.3	4 29 28.9	5.5	9 32 31.5	4 37 24.3	5.5	62 20 50.3	0 50 59.7
6.0	323 0 27.0	−4 47 9.3	6.0	16 48 21.1	−4 19 6.9	6.0	69 11 0.0	−0 15 5.6
6.5	330 11 32.3	5 0 22.0	6.5	24 0 21.7	3 56 51.2	6.5	75 55 25.0	+0 20 31.7
7.0	337 23 20.7	5 8 52.2	7.0	31 8 11.2	3 31 5.7	7.0	82 34 24.4	0 55 23.2
7.5	344 35 16.0	5 12 30.8	7.5	38 11 36.2	3 2 21.2	7.5	89 8 20.6	1 29 3.1
8.0	351 46 44.9	5 11 14.6	8.0	45 10 31.0	2 31 10.1	8.0	95 37 37.5	2 1 8.5
8.5	358 57 17.2	−5 5 6.4	8.5	52 4 56.1	−1 58 5.2	8.5	102 2 39.8	+2 31 19.0
9.0	6 6 27.0	4 54 14.8	9.0	58 54 57.1	1 23 39.3	9.0	108 23 51.9	2 59 16.5
9.5	13 13 52.6	4 38 53.2	9.5	65 40 43.2	0 48 24.3	9.5	114 41 37.1	3 24 45.4
10.0	20 19 16.3	4 19 19.5	10.0	72 22 26.2	−0 12 50.9	10.0	120 56 17.1	3 47 32.2
10.5	27 22 24.2	3 55 55.8	10.5	79 0 19.3	+0 22 31.3	10.5	127 8 11.3	4 7 25.5
11.0	34 23 5.7	−3 29 7.3	11.0	85 34 36.1	+0 57 14.4	11.0	133 17 37.1	+4 24 15.7
11.5	41 21 13.0	2 59 22.0	11.5	92 5 29.9	1 30 52.4	11.5	139 24 49.8	4 37 55.5
12.0	48 16 40.1	2 27 10.0	12.0	98 33 12.9	2 3 1.1	12.0	145 30 2.7	4 48 19.3
12.5	55 9 22.7	1 53 2.7	12.5	104 57 56.2	2 33 18.4	12.5	151 33 27.3	4 55 23.6
13.0	61 59 17.3	1 17 32.5	13.0	111 19 49.2	3 1 24.6	13.0	157 35 13.8	4 59 6.6
13.5	68 46 20.9	−0 41 12.2	13.5	117 38 59.6	+3 27 1.9	13.5	163 35 31.3	+4 59 28.5
14.0	75 30 30.1	−0 4 34.2	14.0	123 55 34.0	3 49 55.0	14.0	169 34 28.6	4 56 31.4
14.5	82 11 41.5	+0 31 49.8	14.5	130 9 37.9	4 9 51.4	14.5	175 32 14.6	4 50 19.1
15.0	88 49 51.6	1 7 29.2	15.0	136 21 15.8	4 26 40.7	15.0	181 28 58.7	4 40 56.9
15.5	95 24 56.3	1 41 55.5	15.5	142 30 32.1	4 40 15.1	15.5	187 24 51.2	4 28 32.1
16.0	101 56 51.9	+2 14 42.2	16.0	148 37 31.9	+4 50 29.3	16.0	193 20 4.2	+4 13 13.1
16.5	108 25 34.8	2 45 25.6	16.5	154 42 20.7	4 57 20.3	16.5	199 14 51.6	3 55 9.6
17.0	114 51 2.3	3 13 44.9	17.0	160 45 5.4	5 0 47.4	17.0	205 9 29.5	3 34 32.6
17.5	121 13 12.9	3 39 22.1	17.5	166 45 55.0	5 0 51.8	17.5	211 4 16.7	3 11 34.2
18.0	127 32 6.6	4 2 2.4	18.0	172 45 0.4	4 57 36.4	18.0	216 59 34.7	2 46 27.2
18.5	133 47 45.5	+4 21 34.2	18.5	178 42 34.9	+4 51 6.0	18.5	222 55 47.7	+2 19 25.4
19.0	140 0 14.0	4 37 48.8	19.0	184 38 55.0	4 41 26.8	19.0	228 53 22.9	1 50 43.5
19.5	146 9 39.9	4 50 40.3	19.5	190 34 20.0	4 28 46.1	19.5	234 52 50.2	1 20 37.0
20.0	152 16 13.4	5 0 5.3	20.0	196 29 12.3	4 13 12.3	20.0	240 54 42.0	0 49 22.3
20.5	158 20 7.9	5 6 2.6	20.5	202 23 57.4	3 54 54.6	20.5	246 59 32.8	+0 17 16.9
21.0	164 21 40.4	+5 8 33.0	21.0	208 19 3.7	+3 34 2.8	21.0	253 7 58.8	−0 15 20.7
21.5	170 21 10.9	5 7 39.0	21.5	214 15 2.3	3 10 47.9	21.5	259 20 37.2	0 48 10.6
22.0	176 19 2.6	5 3 24.3	22.0	220 12 27.2	2 45 21.7	22.0	265 38 6.9	1 20 51.6
22.5	182 15 41.8	4 55 53.8	22.5	226 11 54.5	2 17 56.6	22.5	272 1 3.1	1 53 0.4
23.0	188 11 37.2	4 45 13.4	23.0	232 14 2.0	1 48 46.0	23.0	278 30 1.9	2 24 12.2
23.5	194 7 20.3	+4 31 29.6	23.5	238 19 28.6	+1 18 4.7	23.5	285 5 34.7	−2 54 0.3
24.0	200 3 24.7	4 14 49.7	24.0	244 28 54.0	0 46 8.8	24.0	291 48 8.3	3 21 55.9
24.5	206 0 25.7	3 55 21.8	24.5	250 42 57.6	+0 13 16.1	24.5	298 38 2.9	3 47 29.0
25.0	211 58 59.9	3 33 14.9	25.0	257 2 17.4	−0 20 13.5	25.0	305 35 29.9	4 10 8.5
25.5	217 59 45.0	3 8 38.8	25.5	263 27 29.1	0 53 57.6	25.5	312 40 30.0	4 29 23.0
26.0	224 3 18.5	+2 41 44.6	26.0	269 59 4.7	−1 27 31.4	26.0	319 52 51.8	−4 44 42.1
26.5	230 10 17.9	2 12 44.7	26.5	276 37 30.9	2 0 27.6	26.5	327 12 10.4	4 55 37.6
27.0	236 21 19.7	1 41 53.2	27.0	283 23 7.5	2 32 16.4	27.0	334 37 46.4	5 1 45.2
27.5	242 36 58.4	1 9 26.4	27.5	290 16 5.9	3 2 25.5	27.5	342 8 46.6	5 2 46.3
28.0	248 57 45.5	0 35 42.9	28.0	297 16 26.8	3 30 20.7	28.0	349 44 5.1	4 58 29.6
28.5	255 24 9.0	+0 1 4.3	28.5	304 23 59.0	−3 55 26.9	28.5	357 22 25.1	−4 48 52.3
29.0	261 56 31.4	−0 34 5.2	29.0	311 38 18.6	4 17 9.5	29.0	5 2 22.7	4 34 1.1
29.5	268 35 9.1	1 9 18.5	29.5	318 58 48.7	4 34 55.8	29.5	12 42 30.7	4 14 12.3
30.0	275 20 11.4	1 44 5.1	30.0	326 24 39.0	4 48 16.4	30.0	20 21 22.1	3 49 51.4
30.5	282 11 39.0	2 17 52.2	30.5	333 54 47.5	4 56 47.1	30.5	27 57 34.5	3 21 31.4
31.0	289 9 23.1	−2 50 4.8	31.0	341 28 2.6	−5 0 10.8	31.0	35 29 54.2	−2 49 51.2
31.5	296 13 5.2	−3 20 6.8	31.5	349 3 6.3	−4 58 18.7	31.5	42 57 18.3	−2 15 33.5

FOR GREENWICH MEAN NOON AND MIDNIGHT.

Day of Month.	OCTOBER.		Day of Month.	NOVEMBER.		Day of Month.	DECEMBER.	
	True Longitude.	Latitude.		True Longitude.	Latitude.		True Longitude.	Latitude.
	° ′ ″	° ′ ″		° ′ ″	° ′ ″		° ′ ″	° ′ ″
1.0	35 29 54.2	−2 49 51.2	1.0	87 8 58.2	+1 44 40.1	1.0	122 2 14.4	+4 18 58.8
1.5	42 57 18.3	2 15 33.5	1.5	94 1 47.2	2 19 25.3	1.5	128 32 31.2	4 38 5.3
2.0	50 18 56.4	1 39 22.9	2.0	100 47 42.4	2 51 38.1	2.0	134 57 3.5	4 53 24.9
2.5	57 34 11.7	1 2 3.5	2.5	107 26 55.8	3 20 58.9	2.5	141 16 13.4	5 4 56.6
3.0	64 42 40.8	−0 24 17.4	3.0	113 59 46.1	3 47 12.6	3.0	147 30 27.4	5 12 42.1
3.5	71 44 12.5	+0 13 16.4	3.5	120 26 37.3	+4 10 8.3	3.5	153 40 15.5	+5 16 45.0
4.0	78 38 46.5	0 50 2.9	4.0	126 47 57.3	4 29 38.6	4.0	159 46 10.3	5 17 10.2
4.5	85 26 31.9	1 25 31.5	4.5	133 4 16.7	4 45 38.6	4.5	165 48 46.0	5 14 3.8
5.0	92 7 45.3	1 59 15.8	5.0	139 16 7.8	4 58 5.9	5.0	171 48 37.8	5 7 32.8
5.5	98 42 49.1	2 30 53.4	5.5	145 24 3.8	5 7 0.2	5.5	177 46 21.3	4 57 44.8
6.0	105 12 9.7	+3 0 5.8	6.0	151 28 38.1	+5 12 22.3	6.0	183 42 32.1	+4 44 47.9
6.5	111 36 15.7	3 26 37.7	6.5	157 30 23.4	5 14 14.2	6.5	189 37 45.2	4 28 50.9
7.0	117 55 37.3	3 50 16.8	7.0	163 29 51.3	5 12 39.1	7.0	195 32 34.4	4 10 3.3
7.5	124 10 45.3	4 10 53.3	7.5	169 27 32.0	5 7 41.4	7.5	201 27 32.1	3 48 35.4
8.0	130 22 9.8	4 28 19.8	8.0	175 23 54.3	4 59 26.1	8.0	207 23 9.0	3 24 38.1
8.5	136 30 19.6	+4 42 30.5	8.5	181 19 25.1	+4 47 59.4	8.5	213 19 53.8	+2 58 23.8
9.0	142 35 41.9	4 53 21.4	9.0	187 14 28.8	4 33 28.6	9.0	219 18 12.9	2 30 6.0
9.5	148 38 42.3	5 0 50.1	9.5	193 9 28.0	4 16 1.9	9.5	225 18 30.3	1 59 59.7
10.0	154 39 44.2	5 4 55.6	10.0	199 4 43.4	3 55 49.1	10.0	231 21 7.1	1 28 21.7
10.5	160 39 8.4	5 5 38.4	10.5	205 0 33.7	3 33 1.1	10.5	237 26 21.8	0 55 30.2
11.0	166 37 13.9	+5 3 0.3	11.0	210 57 15.8	+3 7 50.1	11.0	243 34 29.9	+0 21 45.2
11.5	172 34 17.8	4 57 4.5	11.5	216 55 5.3	2 40 30.1	11.5	249 45 44.1	−0 12 31.4
12.0	178 30 35.1	4 47 56.0	12.0	222 54 16.3	2 11 16.5	12.0	256 0 14.4	0 46 56.1
12.5	184 26 19.7	4 35 41.0	12.5	228 55 1.7	1 40 26.4	12.5	262 18 8.1	1 21 4.0
13.0	190 21 44.3	4 20 27.1	13.0	234 57 33.9	1 8 18.1	13.0	268 39 29.5	1 54 29.1
13.5	196 17 1.0	+4 2 23.5	13.5	241 2 4.6	+0 35 11.4	13.5	275 4 20.6	−2 26 44.8
14.0	202 12 21.8	3 41 41.0	14.0	247 8 45.7	+0 1 27.3	14.0	281 32 41.5	2 57 24.0
14.5	208 7 58.7	3 18 31.7	14.5	253 17 49.1	−0 32 32.0	14.5	288 4 30.4	3 25 59.6
15.0	214 4 4.3	2 53 8.9	15.0	259 29 26.9	1 6 23.5	15.0	294 39 43.9	3 52 5.4
15.5	220 0 52.6	2 25 47.4	15.5	265 43 51.6	1 39 43.4	15.5	301 18 17.1	4 15 16.2
16.0	225 58 38.6	+1 56 43.0	16.0	272 1 16.6	−2 12 7.4	16.0	308 0 4.6	−4 35 8.7
16.5	231 57 39.0	1 26 12.7	16.5	278 21 56.0	2 43 10.8	16.5	314 45 0.3	4 51 21.7
17.0	237 58 12.6	0 54 34.3	17.0	284 46 4.4	3 12 29.1	17.0	321 32 57.6	5 3 36.8
17.5	244 0 40.2	+0 22 6.7	17.5	291 13 56.6	3 39 37.6	17.5	328 23 49.7	5 11 38.5
18.0	250 5 24.6	−0 10 50.5	18.0	297 45 47.6	4 4 12.1	18.0	335 17 29.5	5 15 14.7
18.5	256 12 50.8	−0 43 56.8	18.5	304 21 51.9	−4 25 48.9	18.5	342 13 49.6	−5 14 17.1
19.0	262 23 25.6	1 16 50.9	19.0	311 2 22.8	4 44 5.3	19.0	349 12 41.9	5 8 41.5
19.5	268 37 37.2	1 49 10.6	19.5	317 47 31.8	4 58 39.7	19.5	356 13 57.5	4 58 28.1
20.0	274 55 55.2	2 20 32.9	20.0	324 37 27.7	5 9 12.2	20.0	3 17 26.3	4 43 41.7
20.5	281 18 49.3	2 50 33.8	20.5	331 32 15.8	5 15 25.3	20.5	10 22 56.7	4 24 31.9
21.0	287 46 48.7	−3 18 48.7	21.0	338 31 56.6	−5 17 4.3	21.0	17 30 14.8	−4 1 12.9
21.5	294 20 21.0	3 44 52.1	21.5	345 36 25.1	5 13 57.8	21.5	24 39 4.4	3 34 4.1
22.0	300 59 51.2	4 8 17.7	22.0	352 45 29.6	5 5 59.1	22.0	31 49 6.5	3 3 29.7
22.5	307 45 40.3	4 28 39.1	22.5	359 58 51.5	4 53 6.7	22.5	38 59 58.9	2 29 58.6
23.0	314 38 3.5	4 45 29.8	23.0	7 16 4.8	4 35 25.1	23.0	46 11 16.0	1 54 3.7
23.5	321 37 8.7	−4 58 24.4	23.5	14 36 35.6	−4 13 5.4	23.5	53 22 29.2	−1 16 21.3
24.0	328 42 54.8	5 6 59.4	24.0	21 59 42.7	3 46 25.6	24.0	60 33 7.2	−0 37 30.5
24.5	335 55 10.4	5 10 53.9	24.5	29 24 38.3	3 15 50.9	24.5	67 42 36.4	+0 1 48.3
25.0	343 13 33.0	5 9 51.0	25.0	36 50 29.5	2 41 53.3	25.0	74 50 21.7	0 40 54.2
25.5	350 37 27.8	5 3 39.5	25.5	44 16 19.7	2 5 10.6	25.5	81 55 47.5	1 19 7.3
26.0	358 6 8.0	−4 52 15.3	26.0	51 41 10.4	−1 26 25.1	26.0	88 58 19.1	+1 55 50.0
26.5	5 38 35.7	4 35 42.3	26.5	59 4 3.5	0 46 22.1	26.5	95 57 23.4	2 30 28.0
27.0	13 13 43.6	4 14 12.9	27.0	66 24 3.2	−0 5 48.0	27.0	102 52 30.3	3 2 30.8
27.5	20 50 17.6	3 48 8.5	27.5	73 40 18.1	+0 34 31.5	27.5	109 43 13.8	3 31 32.9
28.0	28 26 59.5	3 17 59.1	28.0	80 52 3.0	1 13 52.9	28.0	116 29 12.7	3 57 13.9
28.5	36 2 30.8	−2 44 22.0	28.5	87 58 39.9	+1 51 36.8	28.5	123 10 11.5	+4 19 18.6
29.0	43 35 35.8	2 8 0.0	29.0	94 59 38.6	2 27 8.6	29.0	129 46 0.7	4 37 36.9
29.5	51 5 4.5	1 29 39.7	29.5	101 54 37.7	2 59 59.3	29.5	136 16 37.2	4 52 2.9
30.0	58 29 55.6	0 50 9.2	30.0	108 43 24.8	3 29 45.5	30.0	142 42 4.3	5 2 34.8
30.5	65 49 18.2	−0 10 15.5	30.5	115 25 55.8	3 56 9.5	30.5	149 2 31.4	5 9 14.3
31.0	73 2 32.7	+0 29 16.8	31.0	122 2 14.4	+4 18 58.8	31.0	155 18 13.2	+5 12 5.8
31.5	80 9 11.5	+1 7 47.2	31.5	128 32 31.2	+4 38 5.3	31.5	161 29 29.8	+5 11 15.7

GREENWICH MEAN NOON.

Date.	MOON'S EQUATOR.			Γ′	☊	☾
	i Inclination to the Earth's Equator.	*Δ* Ascending Node on Earth's Equator to Ascending Node on Ecliptic.	☊′ Ascending Node on Earth's Equator.	Longitude of the Moon's Perigee. Daily Motion, + 6′.684	Mean Longitude of Moon's Ascending Node Daily Motion, — 3′.177	Moon's Mean Longitude.
	° ′	° ′	° ′	° ′	° ′	° ′
Jan. 0	23 22.2	268 32.0	356 16.8	340 30.7	85 7.2	21 15.7
10	23 21.4	268 0.2	356 16.9	341 37.6	84 35.5	153 1.5
20	23 20.6	267 28.4	356 17.0	342 44.4	84 3.7	284 47.4
30	23 19.8	266 56.5	356 17.1	343 51.3	83 31.9	56 33.2
Feb. 9	23 18.9	266 24.7	356 17.2	344 58.1	83 0.2	188 19.1
19	23 18.1	265 52.8	356 17.4	346 4.9	82 28.4	320 4.9
Mar. 1	23 17.3	265 20.9	356 17.5	347 11.8	81 56.6	91 50.7
11	23 16.5	264 48.9	356 17.7	348 18.6	81 24.8	223 36.6
21	23 15.6	264 17.0	356 17.9	349 25.5	80 53.1	355 22.4
31	23 14.8	263 45.0	356 18.1	350 32.3	80 21.3	127 8.3
Apr. 10	23 14.0	263 13.0	356 18.3	351 39.2	79 49.5	258 54.1
20	23 13.2	262 41.0	356 18.6	352 46.0	79 17.7	30 39.9
30	23 12.4	262 9.0	356 18.9	353 52.8	78 46.0	162 25.8
May 10	23 11.6	261 37.0	356 19.2	354 59.7	78 14.2	294 11.6
20	23 10.8	261 5.0	356 19.5	356 6.5	77 42.4	65 57.4
30	23 10.0	260 33.0	356 19.8	357 13.4	77 10.7	197 43.3
June 9	23 9.2	260 0.9	356 20.1	358 20.2	76 38.9	329 29.1
19	23 8.4	259 28.8	356 20.5	359 27.1	76 7.1	101 15.0
29	23 7.6	258 56.6	356 20.9	0 33.9	75 35.3	233 0.8
July 9	23 6.8	258 24.5	356 21.3	1 40.7	75 3.6	4 46.6
19	23 5.9	257 52.4	356 21.7	2 47.6	74 31.8	136 32.5
29	23 5.1	257 20.2	356 22.1	3 54.4	74 0.0	268 18.3
Aug. 8	23 4.3	256 48.0	356 22.6	5 1.3	73 28.2	40 4.1
18	23 3.5	256 15.8	356 23.1	6 8.1	72 56.5	171 50.0
28	23 2.7	255 43.6	356 23.6	7 15.0	72 24.7	303 35.8
Sept. 7	23 1.9	255 11.3	356 24.1	8 21.8	71 52.9	75 21.7
17	23 1.1	254 39.1	356 24.6	9 28.6	71 21.2	207 7.5
27	23 0.3	254 6.8	356 25.2	10 35.5	70 49.4	338 53.3
Oct. 7	22 59.5	253 34.5	356 25.8	11 42.3	70 17.6	110 39.2
17	22 58.7	253 2.2	356 26.4	12 49.2	69 45.8	242 25.0
27	22 58.0	252 30.0	356 27.0	13 56.0	69 14.1	14 10.8
Nov. 6	22 57.2	251 57.7	356 27.7	15 2.9	68 42.3	145 56.7
16	22 56.4	251 25.3	356 28.4	16 9.7	68 10.5	277 42.5
26	22 55.6	250 52.9	356 29.1	17 16.5	67 38.7	49 28.4
Dec. 6	22 54.8	250 20.5	356 29.8	18 23.4	67 7.0	181 14.2
16	22 54.0	249 48.0	356 30.5	19 30.2	66 35.2	313 0.0
26	22 53.2	249 15.5	356 31.2	20 37.1	66 3.4	84 45.9
36	22 52.4	248 43.0	356 32.0	21 43.9	65 31.7	216 31.7

Mean Solar Days.	Motion of Moon in Mean Longitude.
	° ′
0.1	1 19.06
0.2	2 38.12
0.3	3 57.18
0.4	5 16.23
0.5	6 35.29
0.6	7 54.35
0.7	9 13.41
0.8	10 32.47
0.9	11 51.53
1.0	13 10.58
2.0	26 21.17
3.0	39 31.75
4.0	52 42.33
5.0	65 52.92
6.0	79 3.50
7.0	92 14.09
8.0	105 24.67
9.0	118 35.25
10.0	131 45.84
Hours.	° ′
1	0 32.94
2	1 5.88
3	1 38.82
4	2 11.76
5	2 44.70
6	3 17.65
7	3 50.59
8	4 23.53
9	4 56.47
10	5 29.41
11	6 2.35
12	6 35.29
13	7 8.23
14	7 41.17
15	8 14.11
16	8 47.06
17	9 20.00
18	9 52.94
19	10 25.88
20	10 58.82
21	11 31.76
22	12 4.70
23	12 37.64

QUANTITIES REQUIRED IN COMPUTING THE MOON'S LIBRATION.

ARGUMENT, (☊−λ), or (☊−λ−180°).

☊−λ	μ	$\frac{1}{A}$	B	☊−λ
°	′		° ′	°
0	0.0	39	0 0.0	180
2	0.0	39	0 3.1	178
4	0.1	39	0 6.2	176
6	0.2	39	0 9.3	174
8	0.2	39	0 12.4	172
10	0.2	39	0 15.4	170
12	0.3	40	0 18.5	168
14	0.3	40	0 21.5	166
16	0.3	40	0 24.5	164
18	0.3	41	0 27.4	162
20	0.4	41	0 30.3	160
22	0.4	42	0 33.2	158
24	0.4	42	0 36.1	156
26	0.5	43	0 38.9	154
28	0.5	44	0 41.7	152
30	0.5	45	0 44.4	150
32	0.5	46	0 47.0	148
34	0.5	47	0 49.7	146
36	0.5	48	0 52.2	144
38	0.6	49	0 54.7	142
40	0.6	50	0 57.1	140
42	0.6	52	0 59.4	138
44	0.6	54	1 1.7	136
46	0.6	56	1 3.9	134
48	0.6	58	1 6.0	132
50	0.6	60	1 8.0	130
52	0.6	63	1 10.0	128
54	0.5	66	1 11.8	126
56	0.5	69	1 13.6	124
58	0.5	73	1 15.3	122
60	0.5	77	1 16.9	120
62	0.5	83	1 18.4	118
64	0.5	89	1 19.8	116
66	0.4	95	1 21.1	114
68	0.4	103	1 22.3	112
70	0.4	113	1 23.4	110
72	0.4	125	1 24.4	108
74	0.3	141	1 25.3	106
76	0.3	160	1 26.1	104
78	0.2	186	1 26.8	102
80	0.2	222	1 27.4	100
82	0.2	278	1 27.9	98
84	0.1	370	1 28.3	96
86	0.1	554	1 28.6	94
88	0.0	1110	1 28.7	92
90	0.0	∞	1 28.8	90

μ has the sign of tan (λ −☊)
A has the sign of cos (☊ − λ)
B has the sign of sin (☊ − λ)
See formulæ, page 440.

SUN'S ABERRATION AND HORIZONTAL PARALLAX.

FOR GREENWICH MEAN NOON.

Date.	Aberration. (*Struve.*)	Hor. Par.
1909.	″	″
Jan. 1	− 20.79	8.95
11	20.78	8.95
21	20.77	8.94
31	20.75	8.93
Feb. 10	20.71	8.92
20	− 20.67	8.90
March 2	20.62	8.87
12	20.57	8.86
22	20.51	8.83
April 1	20.45	8.81
11	− 20.39	8.78
21	20.34	8.76
May 1	20.28	8.73
11	20.23	8.71
21	20.19	8.69
31	− 20.16	8.68
June 10	20.13	8.67
20	20.11	8.66
30	20.10	8.65
July 10	20.10	8.66
20	− 20.11	8.66
30	20.13	8.67
Aug. 9	20.16	8.68
19	20.20	8.70
29	20.24	8.72
Sept. 8	− 20.29	8.74
18	20.34	8.76
28	20.40	8.78
Oct. 8	20.46	8.81
18	20.52	8.83
28	− 20.57	8.86
Nov. 7	20.63	8.88
17	20.68	8.90
27	20.72	8.92
Dec. 7	20.75	8.93
17	− 20.77	8.94
27	20.79	8.95
37	− 20.79	8.95

Sun's Mean Equatorial Horizontal Parallax.

8″.80; log = 0.94448.

(CONSTANTS OF STRUVE AND PETERS.)

FOR GREENWICH MEAN NOON.

Date.	Precession in Longitude from 1909.0.	Nutation.			Obliquity of Ecliptic. (*Peters.*)	Date.	Precession in Longitude from 1909.0.	Nutation.			Obliquity of Ecliptic. (*Peters.*)
		In Longitude.	In R.A.	In Obliquity.				In Longitude.	In R.A.	In Obliquity.	
	"	"	s	"	23° 27′ "		"	"	s	"	23° 27′ "
Jan. 0	− 0.07	− 16.74	− 1.024	+ 0.35	3.93	July 4	+ 25.39	− 16.08	− 0.983	+ 1.91	5.26
5	+ 0.62	16.51	1.010	0.43	4.00	9	26.08	15.89	0.971	2.00	5.34
10	1.31	16.31	0.998	0.52	4.09	14	26.77	15.71	0.960	2.10	5.43
15	2.00	16.13	0.986	0.64	4.20	19	27.46	15.55	0.950	2.21	5.54
20	2.68	15.98	0.976	0.76	4.31	24	28.14	15.42	0.943	2.32	5.65
25	+ 3.37	− 15.86	− 0.969	+ 0.88	4.43	29	+ 28.83	− 15.33	− 0.938	+ 2.44	5.76
30	4.06	15.77	0.965	1.02	4.56	Aug. 3	29.52	15.26	0.934	2.57	5.88
Feb. 4	4.75	15.73	0.963	1.16	4.69	8	30.21	15.23	0.931	2.71	6.01
9	5.44	15.73	0.962	1.29	4.82	13	30.90	15.23	0.932	2.85	6.14
14	6.13	15.77	0.964	1.43	4.95	18	31.59	15.27	0.934	2.98	6.26
19	+ 6.81	− 15.84	− 0.968	+ 1.56	5.08	23	+ 32.27	− 15.34	− 0.938	+ 3.10	6.38
24	7.50	15.94	0.975	1.69	5.20	28	32.96	15.44	0.944	3.21	6.48
Mar. 1	8.19	16.07	0.984	1.80	5.30	Sept. 2	33.65	15.57	0.952	3.31	6.58
6	8.88	16.23	0.994	1.89	5.39	7	34.34	15.73	0.961	3.40	6.67
11	9.57	16.42	1.005	1.97	5.46	12	35.03	15.90	0.971	3.48	6.74
16	+ 10.25	− 16.62	− 1.017	+ 2.04	5.52	17	+ 35.71	− 16.09	− 0.982	+ 3.55	6.80
21	10.94	16.83	1.030	2.09	5.57	22	36.40	16.28	0.994	3.61	6.85
26	11.63	17.03	1.042	2.13	5.60	27	37.09	16.48	1.005	3.64	6.88
31	12.32	17.22	1.054	2.15	5.62	Oct. 2	37.78	16.66	1.017	3.67	6.90
Apr. 5	13.01	17.40	1.065	2.16	5.62	7	38.47	16.83	1.028	3.67	6.89
10	+ 13.69	− 17.57	− 1.075	+ 2.15	5.60	12	+ 39.15	− 16.98	− 1.037	+ 3.65	6.87
15	14.38	17.70	1.084	2.11	5.56	17	39.84	17.11	1.045	3.63	6.84
20	15.07	17.81	1.091	2.08	5.52	22	40.53	17.21	1.052	3.60	6.80
25	15.76	17.91	1.096	2.04	5.47	27	41.22	17.28	1.056	3.55	6.75
30	16.45	17.96	1.098	1.99	5.42	Nov. 1	41.91	17.31	1.058	3.50	6.69
May 5	+ 17.14	− 17.97	− 1.099	+ 1.95	5.37	6	+ 42.60	− 17.30	− 1.058	+ 3.44	6.63
10	17.82	17.95	1.097	1.90	5.31	11	43.28	17.25	1.055	3.38	6.56
15	18.51	17.89	1.094	1.85	5.25	16	43.97	17.17	1.050	3.33	6.50
20	19.20	17.79	1.089	1.80	5.20	21	44.66	17.05	1.043	3.28	6.45
25	19.89	17.67	1.082	1.76	5.16	26	45.35	16.89	1.034	3.24	6.40
30	+ 20.58	− 17.52	− 1.073	+ 1.73	5.12	Dec. 1	+ 46.04	− 16.71	− 1.022	+ 3.21	6.37
June 4	21.26	17.35	1.062	1.72	5.10	6	46.72	16.49	1.008	3.19	6.34
9	21.95	17.15	1.050	1.71	5.09	11	47.41	16.24	0.993	3.18	6.32
14	22.64	16.94	1.038	1.73	5.10	16	48.10	15.96	0.977	3.19	6.32
19	23.33	16.72	1.024	1.77	5.13	21	48.79	15.69	0.961	3.21	6.34
24	+ 24.02	− 16.50	− 1.010	+ 1.80	5.16	26	+ 49.48	− 15.42	− 0.944	+ 3.25	6.37
29	24.70	16.28	0.996	1.85	5.20	31	50.16	15.17	0.928	3.30	6.42
July 4	+ 25.39	− 16.08	− 0.983	+ 1.91	5.26	36	+ 50.85	− 14.93	− 0.913	+ 3.38	6.48

	"	
Precession for 1909 (*Struve*)	50.2659	log = 1.70127
Precession in a Solar day	0.1376	log = 9.13869
Precession in a Sidereal day	0.1372	log = 9.13751

Mean Obliquity, 1909.0.

	°	′	"
Peters	23	27	3.58
Hansen	23	27	3.81
Le Verrier	23	27	3.75
Newcomb	23	27	4.04

FOR GREENWICH MEAN NOON.

Date.	$\delta''\psi$	$\delta''\omega$	Date.	$\delta''\psi$	$\delta''\omega$	Date.	$\delta''\psi$	$\delta''\omega$	Date.	$\delta''\psi$	$\delta''\omega$
	″	″		″	″		″	″		″	″
Jan. 0	− 0.09	+ 0.07	Feb. 15	− 0.17	− 0.09	Apr. 1	+ 0.24	+ 0.01	May 16	− 0.08	+ 0.09
1	0.15	+ 0.04	16	− 0.06	0.10	2	0.20	0.04	17	0.15	0.07
2	0.16	0.00	17	+ 0.05	0.08	3	0.13	0.07	18	0.18	+ 0.02
3	0.12	− 0.04	18	0.14	0.05	4	+ 0.04	0.08	19	0.17	− 0.02
4	− 0.05	0.07	19	0.19	− 0.01	5	− 0.06	0.08	20	0.11	0.06
5	+ 0.03	0.09	20	0.19	+ 0.04	6	0.15	0.07	21	− 0.02	0.08
6	0.11	0.08	21	0.14	0.07	7	0.23	0.04	22	+ 0.08	0.09
7	0.18	0.06	22	+ 0.06	0.09	8	0.27	+ 0.01	23	0.17	0.08
8	0.21	− 0.03	23	− 0.03	0.09	9	0.26	− 0.03	24	0.23	0.05
9	0.21	0.00	24	0.11	0.06	10	0.21	0.07	25	0.25	− 0.02
10	+ 0.17	+ 0.04	25	− 0.14	+ 0.02	11	− 0.13	− 0.09	26	+ 0.23	+ 0.02
11	0.10	0.06	26	0.13	− 0.02	12	− 0.03	0.09	27	0.18	0.05
12	+ 0.02	0.08	27	− 0.08	0.06	13	+ 0.08	0.07	28	0.10	0.08
13	− 0.07	0.09	28	0.00	0.08	14	0.15	− 0.04	29	+ 0.01	0.09
14	0.17	0.08	Mar. 1	+ 0.09	0.09	15	0.17	+ 0.01	30	− 0.09	0.08
15	0.24	0.05	2	0.16	0.08	16	0.15	0.05	31	0.18	0.06
16	0.28	+ 0.01	3	0.22	0.05	17	+ 0.08	0.08	June 1	0.24	+ 0.03
17	0.28	− 0.03	4	0.23	− 0.02	18	− 0.01	0.09	2	0.26	− 0.01
18	0.22	0.07	5	0.22	+ 0.02	19	0.10	0.08	3	0.23	0.05
19	0.12	0.09	6	0.17	0.05	20	0.16	0.05	4	0.17	0.08
20	− 0.01	− 0.09	7	+ 0.09	+ 0.07	21	− 0.17	+ 0.01	5	− 0.07	− 0.10
21	+ 0.10	0.07	8	0.00	0.09	22	0.14	− 0.03	6	+ 0.04	0.09
22	0.19	− 0.04	9	− 0.10	0.08	23	− 0.06	0.07	7	0.13	0.07
23	0.22	+ 0.01	10	0.19	0.06	24	+ 0.03	0.09	8	0.19	− 0.03
24	0.20	0.05	11	0.26	+ 0.03	25	0.13	0.09	9	0.19	+ 0.02
25	0.13	0.08	12	0.28	0.00	26	0.20	0.07	10	0.15	0.06
26	+ 0.04	0.09	13	0.27	− 0.04	27	0.24	0.04	11	+ 0.06	0.09
27	− 0.06	0.08	14	0.20	0.08	28	0.25	− 0.01	12	− 0.04	0.10
28	0.12	0.05	15	− 0.11	0.10	29	0.22	+ 0.03	13	0.13	0.08
29	0.15	+ 0.01	16	0.00	0.09	30	0.16	0.06	14	0.18	+ 0.04
30	− 0.13	− 0.03	17	+ 0.10	− 0.07	May 1	+ 0.07	+ 0.08	15	− 0.19	− 0.01
31	− 0.06	0.07	18	0.17	− 0.02	2	− 0.02	0.09	16	0.14	0.05
Feb. 1	+ 0.02	0.08	19	0.18	+ 0.02	3	0.12	0.08	17	− 0.06	0.08
2	0.10	0.08	20	0.14	0.06	4	0.20	0.05	18	+ 0.04	0.09
3	0.17	0.07	21	+ 0.07	0.09	5	0.25	+ 0.02	19	0.14	0.08
4	0.21	0.04	22	− 0.02	0.09	6	0.26	− 0.02	20	0.21	0.06
5	0.22	− 0.01	23	0.10	0.07	7	0.22	0.06	21	0.24	− 0.03
6	0.19	+ 0.03	24	0.15	+ 0.04	8	0.15	0.09	22	0.24	+ 0.01
7	0.14	0.06	25	0.15	− 0.01	9	− 0.05	0.10	23	0.20	0.04
8	+ 0.05	0.08	26	0.10	0.05	10	+ 0.06	0.09	24	0.12	0.07
9	− 0.04	+ 0.09	27	− 0.02	− 0.08	11	+ 0.14	− 0.05	25	+ 0.03	+ 0.08
10	0.14	0.08	28	+ 0.07	0.09	12	0.18	− 0.01	26	− 0.07	0.08
11	0.22	0.06	29	0.15	0.08	13	0.17	+ 0.04	27	0.16	0.07
12	0.28	+ 0.02	30	0.22	0.06	14	0.11	0.08	28	0.23	+ 0.04
13	0.29	− 0.02	31	0.25	− 0.03	15	+ 0.02	0.10	29	0.26	0.00
14	0.25	0.06	Apr. 1	0.24	+ 0.01	16	− 0.08	0.09	30	0.25	− 0.04
15	− 0.17	− 0.09	2	+ 0.20	+ 0.04	17	− 0.15	+ 0.07	July 1	− 0.20	− 0.07

FOR GREENWICH MEAN NOON.

Date.	$\delta''\psi$	$\delta''\omega$	Date.	$\delta''\psi$	$\delta''\omega$	Date.	$\delta''\psi$	$\delta''\omega$	Date.	$\delta''\psi$	$\delta''\omega$
	″	″		″	″		″	″		″	″
July 1	− 0.20	− 0.07	Aug. 16	+ 0.23	+ 0.03	Oct. 1	− 0.16	+ 0.05	Nov. 16	− 0.07	− 0.10
2	− 0.11	0.09	17	0.17	0.06	2	0.18	0.00	17	+ 0.03	0.09
3	0.00	0.09	18	+ 0.09	0.08	3	0.14	− 0.04	18	0.11	0.07
4	+ 0.11	0.08	19	− 0.01	0.09	4	− 0.06	0.07	19	0.16	− 0.02
5	0.18	− 0.04	20	0.10	0.08	5	+ 0.04	0.09	20	0.16	+ 0.03
6	0.21	+ 0.01	21	0.19	0.06	6	0.14	0.09	21	0.12	0.07
7	0.18	0.05	22	0.25	+ 0.03	7	0.22	0.07	22	+ 0.03	0.10
8	0.11	0.09	23	0.27	− 0.01	8	0.27	− 0.04	23	− 0.07	0.10
9	+ 0.01	0.10	24	0.25	0.05	9	0.27	0.00	24	0.16	0.08
10	− 0.09	0.09	25	0.19	0.08	10	0.23	+ 0.04	25	0.21	+ 0.04
11	− 0.16	+ 0.05	26	− 0.10	− 0.10	11	+ 0.16	+ 0.07	26	− 0.21	− 0.01
12	0.19	0.00	27	+ 0.01	0.09	12	+ 0.07	0.09	27	0.15	0.05
13	0.16	− 0.04	28	0.11	0.06	13	− 0.03	0.09	28	− 0.06	0.08
14	− 0.09	0.07	29	0.17	− 0.02	14	0.13	0.07	29	+ 0.05	0.10
15	+ 0.01	0.09	30	0.18	+ 0.02	15	0.20	0.05	30	0.16	0.09
16	0.11	0.09	31	0.14	0.06	16	0.25	+ 0.01	Dec. 1	0.24	0.06
17	0.19	0.07	Sept. 1	+ 0.07	0.09	17	0.25	− 0.04	2	0.28	− 0.02
18	0.23	− 0.04	2	− 0.02	0.10	18	0.22	0.07	3	0.27	+ 0.02
19	0.24	0.00	3	0.11	0.08	19	0.15	0.09	4	0.22	0.05
20	0.21	+ 0.04	4	0.16	+ 0.04	20	− 0.05	0.10	5	0.14	0.08
21	+ 0.14	+ 0.06	5	− 0.16	− 0.01	21	+ 0.04	− 0.08	6	+ 0.04	+ 0.09
22	+ 0.06	0.08	6	0.11	0.05	22	0.12	0.05	7	− 0.06	0.08
23	− 0.04	0.09	7	− 0.03	0.08	23	0.16	− 0.01	8	0.15	0.06
24	0.13	0.08	8	+ 0.07	0.09	24	0.15	+ 0.04	9	0.21	+ 0.03
25	0.21	0.05	9	0.16	0.08	25	+ 0.09	0.08	10	0.24	0.00
26	0.26	+ 0.02	10	0.22	0.06	26	0.00	0.10	11	0.23	− 0.04
27	0.26	− 0.02	11	0.26	− 0.03	27	− 0.09	0.09	12	0.18	0.07
28	0.23	0.06	12	0.25	+ 0.01	28	0.17	0.07	13	− 0.09	0.09
29	0.15	0.09	13	0.20	0.05	29	0.20	+ 0.03	14	+ 0.01	0.10
30	− 0.05	0.10	14	0.12	0.07	30	0.18	− 0.02	15	0.10	0.08
31	+ 0.06	− 0.08	15	+ 0.03	+ 0.09	31	− 0.11	− 0.06	16	+ 0.16	− 0.04
Aug. 1	0.15	0.05	16	− 0.07	0.08	Nov. 1	− 0.01	0.09	17	0.18	+ 0.01
2	0.20	− 0.01	17	0.16	0.07	2	+ 0.11	0.09	18	0.15	0.06
3	0.19	+ 0.04	18	0.23	+ 0.04	3	0.20	0.08	19	+ 0.07	0.09
4	0.14	0.08	19	0.26	0.00	4	0.26	0.05	20	− 0.03	0.10
5	+ 0.05	0.10	20	0.26	− 0.04	5	0.28	− 0.01	21	0.13	0.09
6	− 0.05	0.09	21	0.21	0.07	6	0.26	+ 0.03	22	0.20	+ 0.05
7	0.13	0.07	22	0.13	0.09	7	0.19	0.06	23	0.22	0.00
8	0.17	+ 0.02	23	− 0.03	0.09	8	0.11	0.08	24	0.19	− 0.04
9	0.16	− 0.02	24	+ 0.07	0.07	9	+ 0.01	0.09	25	− 0.11	0.07
10	− 0.10	− 0.06	25	+ 0.14	− 0.04	10	− 0.09	+ 0.08	26	0.00	− 0.09
11	− 0.01	0.09	26	0.17	+ 0.01	11	0.17	0.06	27	+ 0.12	0.09
12	+ 0.08	0.09	27	0.15	0.05	12	0.23	+ 0.02	28	0.21	0.07
13	0.17	0.08	28	+ 0.08	0.09	13	0.25	− 0.02	29	0.26	− 0.03
14	0.23	0.05	29	− 0.01	0.10	14	0.22	0.05	30	0.27	+ 0.01
15	0.25	− 0.01	30	0.10	0.09	15	0.16	0.08	31	0.23	0.04
16	+ 0.23	+ 0.03	Oct. 1	− 0.16	+ 0.05	16	− 0.07	− 0.10	32	+ 0.16	+ 0.07

PART II

ASTRONOMICAL EPHEMERIS

FOR THE

MERIDIAN OF WASHINGTON.

FORMULÆ FOR THE REDUCTION OF THE POSITIONS OF THE FIXED STARS, USING THE NOTATION OF BESSEL, AND THE CONSTANTS OF STRUVE AND PETERS.

NOTATION.

τ, the time, reckoned in units of one year, from the beginning of the Besselian fictitious year, (1909, January $0^{d}.279$, Washington mean time),

α_0, δ_0, the star's mean right ascension and declination at the beginning of the fictitious year,

α, δ, the star's apparent right ascension and declination at the time τ,

μ, μ', the annual proper motion in right ascension and declination,

$\odot$, the Sun's true longitude,	Γ, the longitude of the Sun's perigee,
Ω, the longitude of the Moon's ascending node,	Γ', the longitude of the Moon's perigee,
ω, the obliquity of the ecliptic,	☾, the Moon's mean longitude.

BESSELIAN STAR-NUMBERS.

$$\begin{aligned} A = \tau &- 0.342\,55 \sin \Omega \\ &+ 0.004\,10 \sin 2\,\Omega \\ &- 0.025\,19 \sin 2\,\odot \\ &+ 0.002\,93 \sin (\odot + 81^\circ\,51') \\ &- 0.004\,05 \sin 2\,☾ \\ &+ 0.001\,35 \sin (☾ - \Gamma') \end{aligned} \qquad \begin{aligned} A' = \tau &- 0.342\,55 \sin \Omega \\ &+ 0.004\,10 \sin 2\,\Omega \\ &- 0.025\,19 \sin 2\,\odot \\ &+ 0.002\,93 \sin (\odot + 81^\circ\,51') \end{aligned}$$

$$\begin{aligned} B = &- \overset{''}{9.2241} \cos \Omega \\ &+ 0.0895 \cos 2\,\Omega \\ &- 0.5506 \cos 2\,\odot \\ &- 0.0092 \cos (\odot + 281^\circ\,23') \\ &- 0.0885 \cos 2\,☾ \end{aligned} \qquad \begin{aligned} B' = &- \overset{''}{9.2241} \cos \Omega \\ &+ 0.0895 \cos 2\,\Omega \\ &- 0.5506 \cos 2\,\odot \\ &- 0.0092 \cos (\odot + 281^\circ\,23') \end{aligned}$$

$$\begin{aligned} C &= - \overset{''}{20.4451} \cos \omega \cos \odot \\ D &= - 20.4451 \sin \odot \\ E &= - 0.0443 \sin \Omega + 0''.0014 \sin 2\,\Omega - 0''.0032 \sin 2\,\odot \end{aligned}$$

Bessel's *Star-Constants.*

$$\begin{aligned} a &= 3^{s}.072\,89 + 1^{s}.336\,75 \sin \alpha_0 \tan \delta_0 = \text{precession in right ascension} \\ b &= \tfrac{1}{15} \cos \alpha_0 \tan \delta_0 \\ c &= \tfrac{1}{15} \cos \alpha_0 \sec \delta_0 \\ d &= \tfrac{1}{15} \sin \alpha_0 \sec \delta_0 \\ a' &= 20''.0513 \cos \alpha_0 = \text{precession in declination} \\ b' &= - \sin \alpha_0 \\ c' &= \tan \omega \cos \delta_0 - \sin \alpha_0 \sin \delta_0 \\ d' &= \cos \alpha_0 \sin \delta_0 \end{aligned}$$

Reduction to Apparent Position.

$$\alpha = \alpha_0 + \tau\mu + Aa + Bb + Cc + Dd + \tfrac{1}{15} E \qquad \text{(in time)}$$
$$\delta = \delta_0 + \tau\mu' + Aa' + Bb' + Cc' + Dd' \qquad \text{(in arc)}$$

INDEPENDENT STAR-NUMBERS.

$$f = 46''.0933\,A + E \text{ (in arc)} = 3^{s}.072\,89\,A + \tfrac{1}{15} E \qquad \text{(in time)}$$
$$f' = 46''.0933\,A' + E \text{ (in arc)} = 3^{s}.072\,89\,A' + \tfrac{1}{15} E \qquad \text{(in time)}$$

$$\begin{aligned} g \sin G &= B & g' \sin G' &= B' & h \sin H &= C \\ g \cos G &= 20''.0513\,A & g' \cos G' &= 20''.0513\,A' & h \cos H &= D \end{aligned} \qquad i = C \tan \omega$$

Reduction to Apparent Position.

$$\alpha = \alpha_0 + f + \tau\mu + \tfrac{1}{15} g \sin (G + \alpha_0) \tan \delta_0 + \tfrac{1}{15} h \sin (H + \alpha_0) \sec \delta_0 \quad \text{(in time)}$$
$$\delta = \delta_0 + \tau\mu' + g \cos (G + \alpha_0) + h \cos (H + \alpha_0) \sin \delta_0 + i \cos \delta_0 \qquad \text{(in arc)}$$

Notes.—(1) The quantities A', B', f', g', and G' are to be used instead of A, B, f, g, and G whenever it is necessary to omit the short period terms, as, for example, in computing the ephemeris of a star at ten-day intervals.

(2) The independent star-numbers are more convenient, when only one or two apparent positions of a star are required, or when Bessel's star-constants are not known with sufficient accuracy. Otherwise, the Besselian star-numbers are more convenient.

(3) In using the star-constants of the *British Association Catalogue*, a, b, c, d, a', b', c', d', with the star-numbers of this Ephemeris, the quantities to be formed are Ac, Bd, Ca, Db, $-Ac'$, $-Bd'$, $-Ca'$, $-Db'$.

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)		Log *A*.	Log *B*.	Log *C*.	Log *D*.
Jan.	0	− 9.52342	− 9.5970	− 0.52054	+ 1.30370
	1	9.51895	9.5708	0.56149	1.30224
	2	9.51352	9.5427	0.59878	1.30064
	3	9.50713	9.5234	0.63300	1.29889
	4	9.49998	9.5224	0.66458	1.29700
(7.0)^{h}	5	− 9.49255	− 9.5453	− 0.69389	+ 1.29496
	6	9.48538	9.5883	0.72122	1.29278
	7	9.47895	9.6424	0.74680	1.29045
	8	9.47363	9.6975	0.77083	1.28797
	9	9.46957	9.7465	0.79346	1.28533
	10	− 9.46663	− 9.7847	− 0.81484	+ 1.28254
	11	9.46443	9.8101	0.83509	1.27960
	12	9.46243	9.8228	0.85430	1.27649
	13	9.46002	9.8243	0.87257	1.27323
	14	9.45668	9.8174	0.88996	1.26980
	15	− 9.45206	− 9.8063	− 0.90656	+ 1.26621
	16	9.44602	9.7965	0.92241	1.26245
	17	9.43873	9.7939	0.93756	1.25852
	18	9.43056	9.8025	0.95208	1.25441
	19	9.42205	9.8233	0.96598	1.25013
(8.0)^{h}	20	− 9.41382	− 9.8540	− 0.97932	+ 1.24566
	21	9.40647	9.8897	0.99213	1.24102
	22	9.40037	9.9254	1.00444	1.23618
	23	9.39563	9.9569	1.01627	1.23115
	24	9.39205	9.9813	1.02765	1.22593
	25	− 9.38917	− 9.9974	− 1.03860	+ 1.22051
	26	9.38638	0.0052	1.04915	1.21488
	27	9.38301	0.0059	1.05931	1.20904
	28	9.37853	0.0019	1.06910	1.20298
	29	9.37264	9.9964	1.07854	1.19671
	30	− 9.36532	− 9.9931	− 1.08764	+ 1.19020
	31	9.35688	9.9952	1.09642	1.18346
Feb.	1	9.34786	0.0047	1.10488	1.17648
	2	9.33895	0.0217	1.11306	1.16924
	3	9.33094	0.0443	1.12094	1.16176
(9.0)^{h}	4	− 9.32441	− 0.0694	− 1.12854	+ 1.15400
	5	9.31967	0.0939	1.13588	1.14596
	6	9.31666	0.1150	1.14296	1.13764
	7	9.31490	0.1308	1.14979	1.12902
	8	9.31370	0.1406	1.15638	1.12009
	9	− 9.31228	− 0.1445	− 1.16274	+ 1.11085
	10	9.30982	0.1437	1.16887	1.10125
	11	9.30572	0.1400	1.17478	1.09131
	12	9.29966	0.1361	1.18047	1.08100
	13	9.29174	0.1345	1.18596	1.07031
	14	− 9.28242	− 0.1374	− 1.19124	+ 1.05921
	15	− 9.27236	− 0.1457	− 1.19632	+ 1.04768
Feb.	15	− 9.27236	− 0.1457	− 1.19632	+ 1.04768
	16	9.26240	0.1592	1.20121	1.03571
	17	9.25346	0.1764	1.20591	1.02326
	18	9.24623	0.1948	1.21043	1.01031
	19	9.24092	0.2122	1.21476	0.99683
(10.0)^{h}	20	− 9.23739	− 0.2266	− 1.21892	+ 0.98279
	21	9.23512	0.2366	1.22290	0.96814
	22	9.23325	0.2418	1.22671	0.95286
	23	9.23083	0.2425	1.23035	0.93688
	24	9.22709	0.2398	1.23382	0.92016
	25	− 9.22144	− 0.2354	− 1.23714	+ 0.90265
	26	9.21370	0.2314	1.24030	0.88427
	27	9.20415	0.2298	1.24330	0.86495
	28	9.19343	0.2322	1.24614	0.84460
Mar.	1	9.18256	0.2390	1.24883	0.82312
	2	− 9.17260	− 0.2498	− 1.25137	+ 0.80041
	3	9.16447	0.2631	1.25376	0.77630
	4	9.15882	0.2770	1.25601	0.75066
	5	9.15579	0.2894	1.25811	0.72328
	6	9.15491	0.2990	1.26007	0.69393
(11.0)^{h}	7	− 9.15515	− 0.3046	− 1.26189	+ 0.66233
	8	9.15534	0.3062	1.26357	0.62812
	9	9.15430	0.3041	1.26511	0.59087
	10	9.15112	0.2994	1.26651	0.54998
	11	9.14526	0.2938	1.26777	0.50473
	12	− 9.13662	− 0.2891	− 1.26890	+ 0.45408
	13	9.12558	0.2870	1.26990	0.39662
	14	9.11297	0.2886	1.27076	0.33026
	15	9.10006	0.2941	1.27148	0.25178
	16	9.08807	0.3027	1.27208	0.15580
	17	− 9.07816	− 0.3132	− 1.27255	+ 0.03232
	18	9.07100	0.3237	1.27288	9.85902
	19	9.06655	0.3325	1.27308	9.56622
	20	9.06419	0.3384	1.27315	+ 8.14322
	21	9.06277	0.3405	1.27309	− 9.53187
(12.0)^{h}	22	− 9.06085	− 0.3389	− 1.27290	− 9.84150
	23	9.05713	0.3342	1.27258	0.02024
	24	9.05069	0.3276	1.27213	0.14633
	25	9.04108	0.3206	1.27154	0.24378
	26	9.02836	0.3150	1.27083	0.32316
	27	− 9.01330	− 0.3122	− 1.26999	− 0.39009
	28	8.99721	0.3131	1.26902	0.44793
	29	8.98168	0.3175	1.26792	0.49881
	30	8.96834	0.3248	1.26668	0.54421
	31	8.95847	0.3332	1.26532	0.58517
Apr.	1	− 8.95265	− 0.3412	− 1.26382	− 0.62245
	2	− 8.95032	− 0.3472	− 1.26219	− 0.65663

E = − 0″.04 = − 0ˢ.003

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)	Log *A*.	Log *B*.	Log *C*.	Log *D*.	Solar Day. (Sid. Hour.)	Log *A*.	Log *B*.	Log *C*.	Log *D*.
Apr. 1	− 8.95265	− 0.3412	− 1.26382	− 0.62245	May 17	+ 8.26340	− 0.2659	− 1.01374	− 1.23226
2	8.95032	0.3472	1.26219	0.65663	18	8.33244	0.2542	1.00246	1.23698
3	8.95036	0.3500	1.26042	0.68821	19	8.40586	0.2430	0.99076	1.24153
4	8.95090	0.3492	1.25852	0.71750	20	8.47828	0.2341	0.97861	1.24591
5	8.94988	0.3449	1.25649	0.74479	21	8.54518	0.2293	0.96600	1.25012
(13.0^h) 6	− 8.94576	− 0.3378	− 1.25431	− 0.77034	(16.0^h) 22	+ 8.60304	− 0.2292	− 0.95288	− 1.25417
7	8.93737	0.3292	1.25200	0.79434	23	8.65031	0.2335	0.93923	1.25806
8	8.92407	0.3209	1.24955	0.81694	24	8.68699	0.2409	0.92503	1.26179
9	8.90612	0.3145	1.24696	0.83830	25	8.71374	0.2493	0.91022	1.26537
10	8.88451	0.3112	1.24422	0.85852	26	8.73223	0.2567	0.89477	1.26880
11	− 8.86100	− 0.3118	− 1.24135	− 0.87771	27	+ 8.74484	− 0.2613	− 0.87863	− 1.27207
12	8.83771	0.3158	1.23832	0.89596	28	8.75450	0.2621	0.86175	1.27520
13	8.81684	0.3222	1.23515	0.91334	29	8.76433	0.2585	0.84406	1.27819
14	8.80010	0.3293	1.23183	0.92992	30	8.77692	0.2511	0.82550	1.28103
15	8.78796	0.3355	1.22836	0.94577	31	8.79428	0.2410	0.80600	1.28373
16	− 8.77996	− 0.3392	− 1.22474	− 0.96093	June 1	+ 8.81704	− 0.2300	− 0.78546	− 1.28630
17	8.77437	0.3396	1.22095	0.97544	2	8.84417	0.2202	0.76378	1.28873
18	8.76849	0.3362	1.21701	0.98936	3	8.87361	0.2137	0.74083	1.29102
19	8.75944	0.3294	1.21291	1.00272	4	8.90320	0.2119	0.71649	1.29318
20	8.74507	0.3202	1.20865	1.01554	5	8.93100	0.2150	0.69058	1.29521
(14.0^h) 21	− 8.72387	− 0.3100	− 1.20421	− 1.02788	(17.0^h) 6	+ 8.95545	− 0.2224	− 0.66290	− 1.29711
22	8.69478	0.3007	1.19961	1.03974	7	8.97562	0.2321	0.63321	1.29888
23	8.65792	0.2938	1.19483	1.05115	8	8.99145	0.2422	0.60122	1.30052
24	8.61500	0.2906	1.18988	1.06215	9	9.00355	0.2507	0.56655	1.30204
25	8.56879	0.2915	1.18474	1.07274	10	9.01309	0.2558	0.52875	1.30343
26	− 8.52336	− 0.2957	− 1.17942	− 1.08296	11	+ 9.02152	− 0.2568	− 0.48722	− 1.30469
27	8.48344	0.3020	1.17391	1.09281	12	9.03036	0.2535	0.44117	1.30583
28	8.45271	0.3084	1.16821	1.10231	13	9.04100	0.2467	0.38951	1.30685
29	8.43249	0.3135	1.16231	1.11149	14	9.05412	0.2379	0.33074	1.30774
30	8.42078	0.3156	1.15620	1.12035	15	9.06986	0.2290	0.26261	1.30851
May 1	− 8.41246	− 0.3140	− 1.14989	− 1.12890	16	+ 9.08757	− 0.2222	− 0.18165	− 1.30916
2	8.40071	0.3085	1.14336	1.13716	17	9.10616	0.2192	0.08191	1.30969
3	8.37876	0.2997	1.13660	1.14514	18	9.12431	0.2211	9.95208	1.31009
4	8.33945	0.2888	1.12962	1.15286	19	9.14085	0.2278	9.76588	1.31038
5	8.27554	0.2776	1.12240	1.16031	20	9.15491	0.2380	− 9.43288	1.31054
(15.0^h) 6	− 8.17725	− 0.2679	− 1.11493	− 1.16751	(18.0^h) 21	+ 9.16605	− 0.2498	+ 8.61721	− 1.31059
7	8.02531	0.2614	1.10722	1.17447	22	9.17438	0.2611	9.54866	1.31051
8	7.76938	0.2592	1.09924	1.18119	23	9.18033	0.2702	9.82339	1.31032
9	− 7.09691	0.2613	1.09098	1.18769	24	9.18481	0.2757	9.99024	1.31000
10	+ 7.46389	0.2666	1.08245	1.19397	25	9.18899	0.2771	0.11038	1.30956
11	+ 7.80277	− 0.2736	− 1.07362	− 1.20003	26	+ 9.19390	− 0.2746	+ 0.20428	− 1.30900
12	7.95569	0.2802	1.06449	1.20589	27	9.20044	0.2693	0.28133	1.30832
13	8.04376	0.2847	1.05504	1.21155	28	9.20909	0.2627	0.34663	1.30752
14	8.10243	0.2858	1.04525	1.21701	29	9.21990	0.2568	0.40328	1.30660
15	8.15137	0.2828	1.03512	1.22228	30	9.23239	0.2535	0.45327	1.30556
16	+ 8.20303	− 0.2759	− 1.02462	− 1.22736	July 1	+ 9.24568	− 0.2542	+ 0.49799	− 1.30439
17	+ 8.26340	− 0.2659	− 1.01374	− 1.23226	2	+ 9.25881	− 0.2594	+ 0.53841	− 1.30309

$E = -\ 0''.04 = -\ 0^s.003$

(CONSTANTS OF STRUVE AND PETERS.)

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)		Log *A*.	Log *B*.	Log *C*.	Log *D*.	Solar Day. (Sid. Hour.)		Log *A*.	Log *B*.	Log *C*.	Log *D*.
July	1	+ 9.24568	− 0.2542	+ 0.49799	− 1.30439	Aug.	16	+ 9.51227	− 0.4760	+ 1.17911	− 1.08354
	2	9.25881	0.2594	0.53841	1.30309		17	9.51333	0.4832	1.18439	1.07345
	3	9.27088	0.2687	0.57529	1.30168		18	9.51387	0.4878	1.18948	1.06300
	4	9.28126	0.2806	0.60916	1.30014		19	9.51441	0.4898	1.19440	1.05215
	5	9.28968	0.2933	0.64047	1.29847	h	20	9.51547	0.4895	1.19914	1.04090
h	6	+ 9.29625	− 0.3048	+ 0.66956	− 1.29668	**(22.0)**	21	+ 9.51742	− 0.4877	+ 1.20370	− 1.02922
(19.0)	7	9.30136	0.3138	0.69672	1.29475		22	9.52046	0.4855	1.20811	1.01709
	8	9.30563	0.3192	0.72217	1.29270		23	9.52457	0.4840	1.21234	1.00448
	9	9.30987	0.3208	0.74610	1.29052		24	9.52947	0.4842	1.21642	0.99136
	10	9.31486	0.3191	0.76867	1.28820		25	9.53472	0.4869	1.22034	0.97770
	11	+ 9.32113	− 0.3153	+ 0.79001	− 1.28575		26	+ 9.53984	− 0.4921	+ 1.22410	− 0.96346
	12	9.32889	0.3110	0.81024	1.28317		27	9.54438	0.4993	1.22771	0.94861
	13	9.33798	0.3079	0.82946	1.28045		28	9.54807	0.5076	1.23116	0.93309
	14	9.34792	0.3075	0.84775	1.27759		29	9.55071	0.5158	1.23447	0.91687
	15	9.35801	0.3110	0.86519	1.27458		30	9.55242	0.5229	1.23764	0.89988
	16	+ 9.36754	− 0.3183	+ 0.88184	− 1.27144		31	+ 9.55347	− 0.5281	+ 1.24065	− 0.88206
	17	9.37589	0.3288	0.89776	1.26815	Sept.	1	9.55427	0.5309	1.24353	0.86334
	18	9.38263	0.3410	0.91300	1.26472		2	9.55523	0.5313	1.24627	0.84364
	19	9.38763	0.3532	0.92762	1.26113		3	9.55676	0.5298	1.24886	0.82285
	20	9.39106	0.3639	0.94164	1.25740	h	4	9.55914	0.5272	1.25132	0.80088
h	21	+ 9.39340	− 0.3718	+ 0.95510	− 1.25351	**(23.0)**	5	+ 9.56246	− 0.5246	+ 1.25364	− 0.77760
(20.0)	22	9.39531	0.3764	0.96805	1.24946		6	9.56657	0.5229	1.25583	0.75284
	23	9.39744	0.3778	0.98051	1.24525		7	9.57113	0.5230	1.25788	0.72644
	24	9.40040	0.3766	0.99250	1.24088		8	9.57572	0.5255	1.25980	0.69818
	25	9.40464	0.3739	1.00406	1.23634		9	9.57991	0.5301	1.26159	0.66780
	26	+ 9.41032	− 0.3713	+ 1.01519	− 1.23163		10	+ 9.58335	− 0.5363	+ 1.26325	− 0.63499
	27	9.41722	0.3701	1.02594	1.22674		11	9.58579	0.5432	1.26478	0.59932
	28	9.42491	0.3717	1.03630	1.22168		12	9.58718	0.5498	1.26618	0.56031
	29	9.43281	0.3767	1.04631	1.21643		13	9.58770	0.5550	1.26745	0.51728
	30	9.44030	0.3848	1.05598	1.21100		14	9.58769	0.5582	1.26859	0.46935
	31	+ 9.44685	− 0.3952	+ 1.06532	− 1.20537		15	+ 9.58756	− 0.5592	+ 1.26960	− 0.41528
Aug.	1	9.45212	0.4065	1.07435	1.19955		16	9 58775	0.5580	1.27049	0.35334
	2	9.45610	0.4174	1.08308	1.19352		17	9.58861	0.5552	1.27124	0.28088
	3	9.45899	0.4265	1.09152	1.18728		18	9.59040	0.5516	1.27188	0.19366
	4	9.46118	0.4329	1.09968	1.18083		19	9.59317	0.5484	1.27238	0.08417
h	5	+ 9.46319	− 0.4364	+ 1.10757	− 1.17416	h	20	+ 9.59672	− 0.5463	+ 1.27276	− 9.93717
(21.0)	6	9.46555	0.4371	1.11521	1.16725	**(0.0)**	21	9.60072	0.5461	1.27301	9.71293
	7	9.46873	0.4358	1.12260	1.16010		22	9.60479	0.5481	1.27313	− 9.22276
	8	9.47298	0.4336	1.12975	1.15271		23	9.60853	0.5521	1.27313	+ 9.26126
	9	9.47826	0.4318	1.13667	1.14507		24	9.61162	0.5574	1.27300	9.72602
	10	+ 9.48433	− 0.4317	+ 1.14335	− 1.13716		25	+ 9.61388	− 0.5630	+ 1.27274	+ 9.94536
	11	9.49076	0.4342	1.14983	1.12897		26	9.61533	0.5679	1.27236	0.09038
	12	9.49700	0.4396	1.15609	1.12050		27	9.61614	0.5714	1.27184	0.19886
	13	9.50256	0.4475	1.16214	1.11174		28	9.61664	0.5728	1.27120	0.28552
	14	9.50705	0.4570	1.16799	1.10267		29	9.61719	0.5719	1.27043	0.35767
	15	+ 9.51027	− 0.4669	+ 1.17365	− 1.09327		30	+ 9.61817	− 0.5691	+ 1.26953	+ 0.41944
	16	+ 9.51227	− 0.4760	+ 1.17911	− 1.08354	Oct.	1	+ 9.61986	− 0.5650	+ 1.26850	+ 0.47342

$E = -0''.04 = -0^{s}.003$

(CONSTANTS OF STRUVE AND PETERS.)

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)	Log *A*.	Log *B*.	Log *C*.	Log *D*.	Solar Day. (Sid. Hour.)	Log *A*.	Log *B*.	Log *C*.	Log *D*.
Oct. 1	+ 9.61986	− 0.5650	+ 1.26850	+ 0.47342	Nov. 16	+ 9.72969	− 0.5108	+ 1.03993	+ 1.21982
2	9.62240	0.5605	1.26734	0.52135	17	9.73331	0.5134	1.02911	1.22523
3	9.62570	0.5565	1.26604	0.56442	18	9.73639	0.5172	1.01788	1.23044
4	9.62954	0.5540	1.26461	0.60351	19	9.73884	0.5210	1.00620	1.23546
5	9.63357	0.5535	1.26305	0.63927	20	9.74073	0.5240	0.99406	1.24028
(1.0^{h}) 6	+ 9.63741	− 0.5552	+ 1.26135	+ 0.67222	(4.0^{h}) 21	+ 9.74226	− 0.5252	+ 0.98142	+ 1.24493
7	9.64068	0.5586	1.25951	0.70274	22	9.74368	0.5241	0.96826	1.24939
8	9.64317	0.5630	1.25754	0.73114	23	9.74525	0.5207	0.95455	1.25367
9	9.64477	0.5675	1.25542	0.75770	24	9.74723	0.5154	0.94024	1.25778
10	9.64559	0.5710	1.25316	0.78263	25	9.74980	0.5090	0.92531	1.26172
11	+ 9.64583	− 0.5728	+ 1.25076	+ 0.80609	26	+ 9.75300	− 0.5027	+ 0.90969	+ 1.26549
12	9.64586	0.5724	1.24822	0.82824	27	9.75673	0.4975	0.89335	1.26909
13	9.64606	0.5700	1.24552	0.84920	28	9.76078	0.4944	0.87622	1.27254
14	9.64682	0.5657	1.24268	0.86908	29	9.76487	0.4938	0.85824	1.27582
15	9.64835	0.5604	1.23968	0.88798	30	9.76872	0.4958	0.83934	1.27894
16	+ 9.65075	− 0.5550	+ 1.23654	+ 0.90597	Dec. 1	+ 9.77208	− 0.4997	+ 0.81942	+ 1.28190
17	9.65392	0.5505	1.23323	0.92314	2	9.77480	0.5045	0.79839	1.28472
18	9.65762	0.5477	1.22977	0.93953	3	9.77686	0.5091	0.77614	1.28737
19	9.66152	0.5471	1.22614	0.95520	4	9.77837	0.5124	0.75254	1.28988
20	9.66527	0.5486	1.22236	0.97021	5	9.77955	0.5137	0.72743	1.29224
(2.0^{h}) 21	+ 9.66853	− 0.5517	+ 1.21840	+ 0.98460	(5.0^{h}) 6	+ 9.78067	− 0.5126	+ 0.70062	+ 1.29446
22	9.67112	0.5555	1.21427	0.99840	7	9.78201	0.5093	0.67190	1.29652
23	9.67300	0.5591	1.20997	1.01167	8	9.78380	0.5043	0.64098	1.29844
24	9.67428	0.5614	1.20549	1.02442	9	9.78618	0.4987	0.60752	1.30022
25	9.67521	0.5619	1.20083	1.03668	10	9.78917	0.4935	0.57112	1.30185
26	+ 9.67610	− 0.5601	+ 1.19598	+ 1.04848	11	+ 9.79266	− 0.4900	+ 0.53123	+ 1.30334
27	9.67730	0.5562	1.19094	1.05985	12	9.79644	0.4887	0.48714	1.30469
28	9.67907	0.5507	1.18571	1.07081	13	9.80024	0.4902	0.43789	1.30590
29	9.68157	0.5444	1.18028	1.08137	14	9.80381	0.4941	0.38217	1.30697
30	9.68480	0.5385	1.17464	1.09155	15	9.80695	0.4995	0.31806	1.30790
31	+ 9.68856	− 0.5338	+ 1.16879	+ 1.10138	16	+ 9.80957	− 0.5056	+ 0.24266	+ 1.30869
Nov. 1	9.69262	0.5311	1.16272	1.11087	17	9.81167	0.5110	0.15116	1.30935
2	9.69666	0.5307	1.15643	1.12003	18	9.81337	0.5148	0.03492	1.30986
3	9.70030	0.5325	1.14990	1.12888	19	9.81488	0.5164	9.87550	1.31024
4	9.70330	0.5356	1.14314	1.13742	20	9.81644	0.5158	9.62069	1.31048
(3.0^{h}) 5	+ 9.70556	− 0.5393	+ 1.13613	+ 1.14568	(6.0^{h}) 21	+ 9.81827	− 0.5130	+ 8.92514	+ 1.31058
6	9.70710	0.5423	1.12887	1.15365	22	9.82055	0.5090	− 9.39660	1.31055
7	9.70807	0.5439	1.12134	1.16136	23	9.82335	0.5048	9.76534	1.31038
8	9.70875	0.5433	1.11354	1.16880	24	9.82662	0.5014	9.96177	1.31007
9	9.70948	0.5404	1.10546	1.17599	25	9.83021	0.4998	0.09643	1.30962
10	+ 9.71060	− 0.5355	+ 1.09708	+ 1.18293	26	+ 9.83390	− 0.5008	− 0.19898	+ 1.30904
11	9.71235	0.5293	1.08840	1.18964	27	9.83744	0.5044	0.28176	1.30832
12	9.71484	0.5226	1.07940	1.19611	28	9.84061	0.5100	0.35116	1.30746
13	9.71803	0.5166	1.07007	1.20236	29	9.84325	0.5169	0.41086	1.30646
14	9.72175	0.5123	1.06039	1.20839	30	9.84530	0.5238	0.46322	1.30532
15	+ 9.72574	− 0.5103	+ 1.05035	+ 1.21421	31	+ 9.84682	− 0.5298	− 0.50982	+ 1.30403
16	+ 9.72969	− 0.5108	+ 1.03993	+ 1.21982	32	+ 9.84796	− 0.5340	− 0.55178	+ 1.30261

E = − 0″.04 = − 0^{s}.003

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)		τ	f	f′	G		H		Log g.	Log h.	i	Log i.
			In Time.	In Time.	In Arc.	In Time.	In Arc.	In Time.				
		y	s	s	° ′	h m	° ′	h m			″	
Jan.	0	0.0006	−1.028	−1.021	183 22.9	12 13.5	350 38.7	23 22.6	+0.82632	+1.30951	−1.44	−0.1578
	1	0.0034	1.018	1.009	183 13.0	12 12.9	349 42.2	23 18.8	0.82177	1.30929	1.58	0.1988
	2	0.0061	1.005	0.998	183 3.3	12 12.2	348 45.8	23 15.1	0.81628	1.30904	1.72	0.2361
	3	0.0088	0.991	0.987	182 57.8	12 11.9	347 49.2	23 11.3	0.80985	1.30878	1.86	0.2703
	4	0.0116	0.974	0.976	183 0.4	12 12.0	346 52.7	23 7.5	0.80272	1.30849	2.00	0.3019
h (7.0)	5	0.0143	−0.958	−0.964	183 13.4	12 12.9	345 56.0	23 3.7	+0.79538	+1.30819	−2.14	−0.3312
	6	0.0170	0.942	0.954	183 37.0	12 14.5	344 59.2	22 59.9	0.78839	1.30786	2.28	0.3585
	7	0.0198	0.929	0.942	184 9.3	12 16.6	344 2.4	22 56.2	0.78224	1.30752	2.42	0.3841
	8	0.0225	0.917	0.932	184 46.4	12 19.1	343 5.5	22 52.4	0.77728	1.30716	2.56	0.4081
	9	0.0252	0.909	0.921	185 23.4	12 21.6	342 8.5	22 48.6	0.77363	1.30678	2.70	0.4308
	10	0.0280	−0.903	−0.910	185 55.3	12 23.7	341 11.3	22 44.8	+0.77109	+1.30638	−2.83	−0.4521
	11	0.0307	0.898	0.899	186 18.5	12 25.2	340 14.1	22 40.9	0.76921	1.30597	2.97	0.4724
	12	0.0335	0.894	0.888	186 31.5	12 26.1	339 16.8	22 37.1	0.76739	1.30553	3.10	0.4916
	13	0.0362	0.889	0.878	186 35.0	12 26.3	338 19.3	22 33.3	0.76503	1.30508	3.23	0.5099
	14	0.0389	0.882	0.867	186 31.7	12 26.1	337 21.7	22 29.4	0.76165	1.30462	3.37	0.5273
	15	0.0417	−0.873	−0.857	186 25.9	12 25.7	336 24.1	22 25.6	+0.75694	+1.30414	−3.50	−0.5438
	16	0.0444	0.861	0.846	186 22.7	12 25.5	335 26.3	22 21.8	0.75086	1.30364	3.63	0.5597
	17	0.0472	0.847	0.836	186 26.8	12 25.8	334 28.3	22 17.9	0.74363	1.30313	3.76	0.5749
	18	0.0499	0.831	0.826	186 41.8	12 26.8	333 30.2	22 14.0	0.73568	1.30260	3.89	0.5894
	19	0.0526	0.815	0.816	187 9.7	12 28.6	332 32.0	22 10.1	0.72759	1.30206	4.01	0.6033
h (8.0)	20	0.0554	−0.800	−0.806	187 49.5	12 31.3	331 33.7	22 6.2	+0.72002	+1.30151	−4.14	−0.6166
	21	0.0581	0.786	0.796	188 37.7	12 34.5	330 35.2	22 2.3	0.71355	1.30095	4.26	0.6294
	22	0.0608	0.775	0.786	189 29.1	12 37.9	329 36.5	21 58.4	0.70849	1.30038	4.38	0.6417
	23	0.0636	0.767	0.776	190 17.6	12 41.1	328 37.7	21 54.5	0.70482	1.29979	4.50	0.6536
	24	0.0663	0.761	0.766	190 57.8	12 43.9	327 38.8	21 50.6	0.70218	1.29919	4.62	0.6649
	25	0.0691	−0.756	−0.757	191 26.4	12 45.8	326 39.8	21 46.7	+0.70002	+1.29858	−4.74	−0.6759
	26	0.0718	0.751	0.747	191 42.9	12 46.9	325 40.6	21 42.7	0.69766	1.29797	4.86	0.6864
	27	0.0745	0.745	0.738	191 49.3	12 47.3	324 41.2	21 38.7	0.69446	1.29735	4.97	0.6966
	28	0.0773	0.737	0.728	191 50.0	12 47.3	323 41.7	21 34.8	0.69000	1.29671	5.09	0.7064
	29	0.0800	0.727	0.719	191 50.7	12 47.4	322 42.0	21 30.8	0.68413	1.29608	5.20	0.7158
	30	0.0828	−0.715	−0.710	191 57.0	12 47.8	321 42.2	21 26.8	+0.67698	+1.29544	−5.31	−0.7249
	31	0.0855	0.702	0.701	192 14.0	12 48.9	320 42.2	21 22.8	0.66899	1.29479	5.42	0.7337
Feb.	1	0.0882	0.687	0.692	192 45.0	12 51.0	319 42.1	21 18.8	0.66082	1.29414	5.52	0.7422
	2	0.0910	0.673	0.683	193 30.4	12 54.0	318 41.8	21 14.8	0.65327	1.29348	5.63	0.7504
	3	0.0937	0.661	0.674	194 27.2	12 57.8	317 41.3	21 10.8	0.64705	1.29282	5.73	0.7582
h (9.0)	4	0.0964	−0.651	−0.666	195 29.8	13 2.0	316 40.7	21 6.7	+0.64262	+1.29216	−5.83	−0.7658
	5	0.0992	0.644	0.657	196 31.0	13 6.1	315 39.9	21 2.7	0.64011	1.29150	5.93	0.7732
	6	0.1019	0.640	0.649	197 24.2	13 9.6	314 38.9	20 58.6	0.63915	1.29083	6.03	0.7803
	7	0.1046	0.637	0.640	198 4.7	13 12.3	313 37.8	20 54.5	0.63903	1.29017	6.12	0.7871
	8	0.1074	0.636	0.632	198 30.5	13 14.0	312 36.5	20 50.4	0.63892	1.28951	6.22	0.7937
	9	0.1101	−0.633	−0.624	198 43.3	13 14.9	311 35.1	20 46.3	+0.63803	+1.28886	−6.31	−0.8000
	10	0.1129	0.630	0.616	198 47.3	13 15.2	310 33.5	20 42.2	0.63574	1.28820	6.40	0.8062
	11	0.1156	0.624	0.608	198 48.4	13 15.2	309 31.7	20 38.1	0.63169	1.28755	6.49	0.8121
	12	0.1183	0.615	0.600	198 53.5	13 15.6	308 29.7	20 34.0	0.62585	1.28690	6.57	0.8178
	13	0.1211	0.604	0.592	199 8.9	13 16.6	307 27.6	20 29.8	0.61860	1.28626	6.66	0.8232
	14	0.1238	−0.592	−0.585	199 39.1	13 18.6	306 25.3	20 25.7	+0.61062	+1.28562	−6.74	−0.8285
	15	0.1266	−0.578	−0.577	200 26.1	13 21.7	305 22.9	20 21.5	+0.60272	+1.28500	−6.82	−0.8336

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)	τ	*f*	*f'*	*G*		*H*		Log *g*.	Log *h*.	*i*	Log *i*.
		In Time.	In Time.	In Arc.	In Time.	In Arc.	In Time.				
	y	s	s	° '	h m	° '	h m			"	
Feb. 15	0.1266	−0.578	−0.577	200 26.1	13 21.7	305 22.9	20 21.5	+0.60272	+1.28500	−6.82	−0.8336
16	0.1293	0.565	0.570	201 28.1	13 25.9	304 20.3	20 17.4	0.59577	1.28438	6.89	0.8385
17	0.1320	0.554	0.562	202 39.9	13 30.7	303 17.5	20 13.2	0.59050	1.28376	6.97	0.8432
18	0.1348	0.544	0.555	203 53.8	13 35.6	302 14.6	20 9.0	0.58729	1.28316	7.04	0.8477
19	0.1375	0.538	0.548	205 1.5	13 40.1	301 11.6	20 4.8	0.58587	1.28257	7.11	0.8520
h (10.0) 20	0.1402	−0.534	−0.540	205 56.4	13 43.8	300 8.4	20 0.6	+0.58565	+1.28200	−7.18	−0.8562
21	0.1430	0.531	0.533	206 35.0	13 46.3	299 5.0	19 56.3	0.58578	1.28143	7.25	0.8602
22	0.1457	0.528	0.526	206 57.5	13 47.8	298 1.6	19 52.1	0.58535	1.28088	7.31	0.8640
23	0.1485	0.526	0.519	207 7.5	13 48.5	296 58.0	19 47.9	0.58358	1.28034	7.37	0.8676
24	0.1512	0.521	0.512	207 10.8	13 48.7	295 54.3	19 43.6	0.58005	1.27981	7.43	0.8711
25	0.1539	−0.514	−0.506	207 14.9	13 49.0	294 50.4	19 39.4	+0.57467	+1.27930	−7.49	−0.8744
26	0.1567	0.505	0.499	207 27.0	13 49.8	293 46.5	19 35.1	0.56771	1.27881	7.54	0.8776
27	0.1594	0.494	0.492	207 53.0	13 51.5	292 42.4	19 30.8	0.55986	1.27833	7.60	0.8806
28	0.1622	0.482	0.486	208 36.2	13 54.4	291 38.3	19 26.6	0.55209	1.27787	7.65	0.8834
Mar. 1	0.1649	0.471	0.479	209 35.7	13 58.4	290 34.0	19 22.3	0.54541	1.27743	7.69	0.8861
2	0.1676	−0.460	−0.473	210 47.1	14 3.1	289 29.7	19 18.0	+0.54070	+1.27701	−7.74	−0.8887
3	0.1704	0.452	0.466	212 2.6	14 8.2	288 25.3	19 13.7	0.53840	1.27661	7.78	0.8911
4	0.1731	0.446	0.460	213 12.8	14 12.9	287 20.8	19 9.4	0.53842	1.27623	7.82	0.8933
5	0.1758	0.443	0.454	214 9.3	14 16.6	286 16.2	19 5.1	0.54015	1.27586	7.86	0.8954
6	0.1786	0.442	0.447	214 47.7	14 19.2	285 11.6	19 0.8	0.54260	1.27552	7.90	0.8974
h (11.0) 7	0.1813	−0.442	−0.441	215 7.9	14 20.5	284 6.8	18 56.5	+0.54462	+1.27520	−7.93	−0.8992
8	0.1840	0.442	0.435	215 13.0	14 20.9	283 2.1	18 52.1	0.54527	1.27490	7.96	0.9009
9	0.1868	0.441	0.429	215 8.9	14 20.6	281 57.3	18 47.8	0.54386	1.27463	7.99	0.9024
10	0.1895	0.438	0.423	215 3.3	14 20.2	280 52.4	18 43.5	0.54019	1.27437	8.01	0.9038
11	0.1923	0.432	0.417	215 4.3	14 20.3	279 47.5	18 39.2	0.53442	1.27414	8.04	0.9051
12	0.1950	−0.424	−0.410	215 19.0	14 21.3	278 42.5	18 34.8	+0.52709	+1.27394	−8.06	−0.9062
13	0.1977	0.413	0.404	215 52.5	14 23.5	277 37.5	18 30.5	0.51908	1.27375	8.08	0.9072
14	0.2005	0.401	0.398	216 46.1	14 27.1	276 32.5	18 26.2	0.51144	1.27359	8.09	0.9080
15	0.2032	0.390	0.392	217 56.4	14 31.8	275 27.5	18 21.8	0.50531	1.27346	8.10	0.9088
16	0.2060	0.379	0.386	219 16.1	14 37.1	274 22.5	18 17.4	0.50136	1.27335	8.12	0.9094
17	0.2087	−0.371	−0.381	220 35.5	14 42.4	273 17.5	18 13.2	+0.49985	+1.27327	−8.12	−0.9098
18	0.2114	0.365	0.375	221 44.8	14 47.0	272 12.5	18 8.8	0.50035	1.27320	8.13	0.9102
19	0.2142	0.361	0.369	222 37.1	14 50.5	271 7.5	18 4.5	0.50188	1.27316	8.13	0.9104
20	0.2169	0.359	0.363	223 9.5	14 52.6	270 2.5	18 0.2	0.50332	1.27315	8.14	0.9104
21	0.2196	0.358	0.357	223 23.4	14 53.6	268 57.5	17 55.8	0.50357	1.27316	8.14	0.9104
h (12.0) 22	0.2224	−0.356	−0.351	223 24.8	14 53.7	267 52.7	17 51.5	+0.50181	+1.27319	−8.13	−0.9102
23	0.2251	0.353	0.345	223 20.9	14 53.4	266 47.9	17 47.2	0.49762	1.27326	8.13	0.9099
24	0.2279	0.348	0.339	223 20.0	14 53.3	265 43.2	17 42.9	0.49107	1.27334	8.12	0.9094
25	0.2306	0.341	0.333	223 30.4	14 54.0	264 38.5	17 38.6	0.48269	1.27345	8.11	0.9088
26	0.2333	0.331	0.327	223 58.5	14 55.9	263 33.8	17 34.3	0.47340	1.27358	8.09	0.9081
27	0.2361	−0.320	−0.321	224 47.1	14 59.1	262 29.3	17 30.0	+0.46437	+1.27374	−8.08	−0.9073
28	0.2388	0.308	0.315	225 54.2	15 3.6	261 24.9	17 25.7	0.45684	1.27392	8.06	0.9063
29	0.2415	0.298	0.309	227 13.3	15 8.9	260 20.5	17 21.4	0.45185	1.27412	8.04	0.9052
30	0.2443	0.289	0.303	228 34.3	15 14.3	259 16.3	17 17.1	0.44984	1.27434	8.02	0.9040
31	0.2470	0.282	0.297	229 46.1	15 19.1	258 12.2	17 12.8	0.45046	1.27459	7.99	0.9026
Apr. 1	0.2498	−0.278	−0.291	230 39.8	15 22.7	257 8.2	17 8.5	+0.45277	+1.27486	−7.96	−0.9011
2	0.2525	−0.277	−0.285	231 12.0	15 24.8	256 4.3	17 4.3	+0.45546	+1.27515	−7.93	−0.8995

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)		τ	f	f′	G		H		Log g.	Log h.	i	Log i.
			In Time.	In Time.	In Arc.	In Time.	In Arc.	In Time.				
		y	s	s	° ′	h m	° ′	h m			″	
Apr.	1	0.2498	−0.278	−0.291	230 39.8	15 22.7	257 8.2	17 8.5	+0.45277	+1.27486	−7.96	−0.9011
	2	0.2525	0.277	0.285	231 12.0	15 24.8	256 4.3	17 4.3	0.45546	1.27515	7.93	0.8995
	3	0.2552	0.277	0.278	231 22.7	15 25.5	255 0.5	17 0.0	0.45720	1.27546	7.90	0.8977
	4	0.2580	0.277	0.272	231 17.5	15 25.2	253 56.9	16 55.8	0.45690	1.27579	7.87	0.8958
h	5	0.2607	0.277	0.266	231 4.7	15 24.3	252 53.4	16 51.6	0.45389	1.27614	7.83	0.8938
(13.0)	6	0.2634	−0.274	−0.260	230 53.2	15 23.5	251 50.1	16 47.3	+0.44798	+1.27652	−7.79	−0.8916
	7	0.2662	0.269	0.253	230 52.5	15 23.5	250 46.9	16 43.1	0.43948	1.27691	7.75	0.8893
	8	0.2689	0.261	0.247	231 11.8	15 24.8	249 43.8	16 38.9	0.42919	1.27732	7.71	0.8868
	9	0.2717	0.250	0.240	231 56.4	15 27.8	248 40.9	16 34.7	0.41832	1.27774	7.66	0.8842
	10	0.2744	0.238	0.234	233 6.5	15 32.4	247 38.2	16 30.5	0.40828	1.27818	7.61	0.8815
	11	0.2771	−0.226	−0.227	234 37.1	15 38.5	246 35.6	16 26.4	+0.40044	+1.27864	−7.56	−0.8786
	12	0.2799	0.214	0.220	236 18.1	15 45.2	245 33.2	16 22.2	0.39569	1.27912	7.51	0.8756
	13	0.2826	0.204	0.214	237 56.4	15 51.8	244 31.0	16 18.1	0.39405	1.27961	7.46	0.8724
	14	0.2854	0.197	0.207	239 20.4	15 57.4	243 28.9	16 13.9	0.39472	1.28011	7.40	0.8691
	15	0.2881	0.192	0.200	240 23.2	16 1.5	242 27.0	16 9.8	0.39625	1.28063	7.34	0.8657
	16	0.2908	−0.188	−0.193	241 2.9	16 4.2	241 25.3	16 5.7	+0.39719	+1.28116	−7.28	−0.8620
	17	0.2936	0.186	0.186	241 22.8	16 5.5	240 23.7	16 1.6	0.39616	1.28171	7.22	0.8582
	18	0.2963	0.183	0.179	241 31.1	16 6.1	239 22.4	15 57.5	0.39222	1.28226	7.15	0.8543
	19	0.2990	0.180	0.172	241 38.6	16 6.6	238 21.2	15 53.4	0.38493	1.28283	7.08	0.8502
h	20	0.3018	0.174	0.165	241 55.6	16 7.7	237 20.3	15 49.4	0.37455	1.28340	7.01	0.8459
(14.0)	21	0.3045	−0.166	−0.158	242 31.6	16 10.1	236 19.5	15 45.3	+0.36199	+1.28399	−6.94	−0.8415
	22	0.3072	0.155	0.150	243 34.6	16 14.3	235 18.9	15 41.3	0.34858	1.28458	6.87	0.8369
	23	0.3100	0.143	0.142	245 7.3	16 20.5	234 18.6	15 37.2	0.33609	1.28518	6.79	0.8321
	24	0.3127	0.130	0.135	247 3.8	16 28.3	233 18.4	15 33.2	0.32638	1.28579	6.72	0.8272
	25	0.3155	0.117	0.127	249 12.4	16 36.8	232 18.4	15 29.2	0.32071	1.28640	6.64	0.8220
	26	0.3182	−0.106	−0.119	251 17.4	16 45.2	231 18.7	15 25.2	+0.31928	+1.28702	−6.56	−0.8167
	27	0.3209	0.096	0.112	253 3.8	16 52.3	230 19.2	15 21.3	0.32122	1.28764	6.48	0.8112
	28	0.3237	0.090	0.104	254 23.0	16 57.5	229 19.8	15 17.3	0.32479	1.28827	6.39	0.8055
	29	0.3264	0.086	0.096	255 13.5	17 0.9	228 20.7	15 13.4	0.32807	1.28890	6.30	0.7996
	30	0.3292	0.084	0.088	255 40.2	17 2.7	227 21.7	15 9.4	0.32931	1.28953	6.22	0.7935
May	1	0.3319	−0.082	−0.080	255 52.8	17 3.5	226 23.0	15 5.5	+0.32731	+1.29016	−6.13	−0.7872
	2	0.3346	0.080	0.072	256 4.4	17 4.3	225 24.5	15 1.6	0.32144	1.29080	6.04	0.7806
	3	0.3374	0.077	0.063	256 28.4	17 5.9	224 26.2	14 57.7	0.31188	1.29143	5.94	0.7739
	4	0.3401	0.070	0.055	257 18.2	17 9.2	223 28.1	14 53.9	0.29956	1.29206	5.85	0.7669
h	5	0.3428	0.061	0.046	258 42.8	17 14.9	222 30.2	14 50.0	0.28604	1.29269	5.75	0.7597
(15.0)	6	0.3456	−0.049	−0.038	260 45.4	17 23.0	221 32.4	14 46.2	+0.27356	+1.29332	−5.65	−0.7522
	7	0.3483	0.036	0.029	263 21.6	17 33.4	220 34.9	14 42.3	0.26435	1.29395	5.55	0.7445
	8	0.3511	0.021	0.020	266 17.2	17 45.1	219 37.5	14 38.5	0.26012	1.29457	5.45	0.7365
	9	0.3538	−0.007	0.011	269 12.8	17 56.9	218 40.4	14 34.7	0.26130	1.29519	5.35	0.7283
	10	0.3565	+0.006	−0.002	271 48.5	18 7.2	217 43.4	14 30.9	0.26679	1.29580	5.25	0.7197
	11	0.3593	+0.016	+0.007	273 52.8	18 15.5	216 46.6	14 27.1	+0.27456	+1.29641	−5.14	−0.7109
	12	0.3620	0.025	0.016	275 25.5	18 21.7	215 50.0	14 23.3	0.28214	1.29702	5.03	0.7018
	13	0.3648	0.031	0.025	276 34.0	18 26.3	214 53.5	14 19.6	0.28759	1.29762	4.92	0.6923
	14	0.3675	0.036	0.034	277 29.3	18 30.0	213 57.3	14 15.8	0.28955	1.29820	4.81	0.6825
	15	0.3702	0.040	0.044	278 25.6	18 33.7	213 1.2	14 12.1	0.28756	1.29878	4.70	0.6724
	16	0.3730	+0.046	+0.053	279 37.3	18 38.5	212 5.3	14 8.4	+0.28207	+1.29935	−4.59	−0.6619
	17	0.3757	+0.053	+0.062	281 16.5	18 45.1	211 9.5	14 4.6	+0.27435	+1.29992	−4.48	−0.6510

(CONSTANTS OF STRUVE AND PETERS.)

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)		τ	f	f′	G		H		Log g.	Log h.	i	Log i.
			In Time.	In Time.	In Arc.	In Time.	In Arc.	In Time.				
		y	s	s	° ′	h m	° ′	h m			″	
May	17	0.3757	+0.053	+0.062	281 16.5	18 45.1	211 9.5	14 4.6	+0.27435	+1.29992	−4.48	−0.6510
	18	0.3784	0.063	0.072	283 30.0	18 54.0	210 13.9	14 0.9	0.26641	1.30047	4.36	0.6398
	19	0.3812	0.075	0.082	286 15.9	19 5.0	209 18.5	13 57.2	0.26073	1.30101	4.25	0.6280
	20	0.3839	0.089	0.092	289 22.9	19 17.4	208 23.2	13 53.5	0.25948	1.30154	4.13	0.6159
h	21	0.3866	0.105	0.101	292 32.2	19 30.1	207 28.0	13 49.9	0.26380	1.30206	4.01	0.6033
(16.0)	22	0.3894	+0.120	+0.111	295 22.2	19 41.5	206 33.1	13 46.2	+0.27326	+1.30257	−3.89	−0.5902
	23	0.3921	0.134	0.121	297 37.9	19 50.5	205 38.3	13 42.6	0.28612	1.30307	3.77	0.5765
	24	0.3949	0.146	0.131	299 14.9	19 57.0	204 43.6	13 38.9	0.30013	1.30355	3.65	0.5623
	25	0.3976	0.156	0.141	300 17.7	20 1.2	203 49.1	13 35.3	0.31307	1.30403	3.53	0.5475
	26	0.4003	0.163	0.152	300 56.1	20 3.7	202 54.7	13 31.6	0.32334	1.30448	3.40	0.5321
	27	0.4031	+0.168	+0.162	301 24.1	20 5.6	202 0.4	13 28.0	+0.33011	+1.30492	−3.28	−0.5159
	28	0.4058	0.172	0.172	301 55.7	20 7.7	201 6.3	13 24.4	0.33331	1.30535	3.16	0.4990
	29	0.4086	0.176	0.182	302 43.4	20 10.9	200 12.3	13 20.8	0.33359	1.30577	3.03	0.4814
	30	0.4113	0.181	0.193	303 56.1	20 15.7	199 18.4	13 17.2	0.33223	1.30617	2.90	0.4628
	31	0.4140	0.188	0.203	305 38.0	20 22.5	198 24.6	13 13.6	0.33107	1.30655	2.78	0.4433
June	1	0.4168	+0.199	+0.214	307 46.0	20 31.1	197 31.0	13 10.1	+0.33211	+1.30692	−2.65	−0.4228
	2	0.4195	0.212	0.224	310 8.9	20 40.6	196 37.5	13 6.5	0.33690	1.30727	2.52	0.4011
	3	0.4222	0.227	0.235	312 30.0	20 50.0	195 44.0	13 2.9	0.34607	1.30760	2.39	0.3781
	4	0.4250	0.243	0.246	314 34.2	20 58.3	194 50.7	12 59.4	0.35915	1.30792	2.26	0.3538
h	5	0.4277	0.259	0.256	316 11.6	21 4.8	193 57.4	12 55.9	0.37480	1.30822	2.13	0.3279
(17.0)	6	0.4305	+0.274	+0.267	317 19.3	21 9.3	193 4.2	12 52.3	+0.39120	+1.30851	−2.00	−0.3002
	7	0.4332	0.287	0.278	318 0.4	21 12.0	192 11.1	12 48.7	0.40664	1.30878	1.86	0.2705
	8	0.4359	0.298	0.289	318 22.8	21 13.5	191 18.1	12 45.2	0.41994	1.30902	1.73	0.2385
	9	0.4387	0.307	0.300	318 37.2	21 14.5	190 25.1	12 41.7	0.43043	1.30926	1.60	0.2038
	10	0.4414	0.314	0.311	318 54.5	21 15.6	189 32.2	12 38.1	0.43805	1.30947	1.47	0.1660
	11	0.4442	+0.320	+0.322	319 23.7	21 17.6	188 39.4	12 34.6	+0.44329	+1.30967	−1.33	−0.1245
	12	0.4469	0.327	0.333	320 11.0	21 20.7	187 46.6	12 31.1	0.44709	1.30984	1.20	0.0785
	13	0.4496	0.335	0.344	321 18.5	21 25.2	186 53.8	12 27.5	0.45074	1.31000	1.06	0.0268
	14	0.4524	0.345	0.355	322 42.8	21 30.9	186 1.1	12 24.1	0.45556	1.31014	0.93	9.9680
	15	0.4551	0.358	0.366	324 16.0	21 37.1	185 8.5	12 20.6	0.46258	1.31026	0.79	9.8997
	16	0.4578	+0.373	+0.377	325 47.0	21 43.1	184 15.8	12 17.1	+0.47225	+1.31036	−0.66	−9.8189
	17	0.4606	0.390	0.388	327 5.7	21 48.3	183 23.2	12 13.5	0.48424	1.31045	0.52	9.7192
	18	0.4633	0.406	0.399	328 4.0	21 52.3	182 30.7	12 10.0	0.49771	1.31051	0.39	9.5894
	19	0.4660	0.422	0.410	328 38.9	21 54.6	181 38.1	12 6.5	0.51153	1.31057	0.25	9.4032
h	20	0.4688	0.436	0.421	328 52.4	21 55.5	180 45.6	12 3.0	0.52458	1.31058	−0.12	−9.0702
(18.0)	21	0.4715	+0.448	+0.432	328 50.1	21 55.3	179 53.0	11 59.5	+0.53592	+1.31059	+0.02	+8.2545
	22	0.4743	0.456	0.444	328 39.5	21 54.6	179 0.5	11 56.0	0.54502	1.31058	0.15	9.1860
	23	0.4770	0.463	0.455	328 28.5	21 53.9	178 8.0	11 52.6	0.55180	1.31055	0.29	9.4607
	24	0.4797	0.467	0.466	328 25.0	21 53.7	177 15.5	11 49.0	0.55657	1.31050	0.42	9.6275
	25	0.4825	0.472	0.477	328 34.8	21 54.3	176 23.0	11 45.5	0.55999	1.31043	0.56	9.7477
	26	0.4852	+0.477	+0.488	329 0.6	21 56.0	175 30.4	11 42.0	+0.56293	+1.31034	+0.69	+9.8416
	27	0.4880	0.485	0.499	329 41.8	21 58.8	174 37.9	11 38.5	0.56635	1.31023	0.83	9.9186
	28	0.4907	0.494	0.510	330 34.0	22 2.3	173 45.3	11 35.0	0.57122	1.31011	0.96	9.9839
	29	0.4934	0.507	0.521	331 30.1	22 6.0	172 52.7	11 31.5	0.57813	1.30996	1.10	0.0406
	30	0.4962	0.522	0.532	332 22.0	22 9.5	172 0.1	11 28.0	0.58713	1.30980	1.23	0.0906
July	1	0.4989	+0.538	+0.543	333 2.5	22 12.2	171 7.4	11 24.5	+0.59778	+1.30962	+1.36	+0.1353
	2	0.5016	+0.555	+0.554	333 27.6	22 13.8	170 14.7	11 21.0	+0.60930	+1.30942	+1.50	+0.1757

(CONSTANTS OF STRUVE AND PETERS.)

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)		τ	*f*	*f′*	*G*		*H*		Log *g*.	Log *h*.	*i*	Log *i*.
			In Time.	In Time.	In Arc.	In Time.	In Arc.	In Time.				
		y	s	s	° ′	h m	° ′	h m			″	
July	1	0.4989	+0.538	+0.543	333 2.5	22 12.2	171 7.4	11 24.5	+0.59778	+1.30962	+1.36	+0.1353
	2	0.5016	0.555	0.554	333 27.6	22 13.8	170 14.7	11 21.0	0.60930	1.30942	1.50	0.1757
	3	0.5044	0.571	0.565	333 36.4	22 14.4	169 21.9	11 17.5	0.62081	1.30920	1.63	0.2126
	4	0.5071	0.584	0.576	333 31.7	22 14.1	168 29.1	11 13.9	0.63150	1.30897	1.76	0.2464
	5	0.5099	0.596	0.586	333 18.2	22 13.2	167 36.3	11 10.4	0.64078	1.30871	1.90	0.2778
h	6	0.5126	+0.605	+0.597	333 2.3	22 12.2	166 43.3	11 6.9	+0.64836	+1.30844	+2.03	+0.3069
(19.0)	7	0.5153	0.612	0.608	332 50.0	22 11.3	165 50.3	11 3.4	0.65426	1.30816	2.16	0.3340
	8	0.5181	0.618	0.619	332 46.4	22 11.1	164 57.2	10 59.8	0.65879	1.30785	2.29	0.3595
	9	0.5208	0.624	0.630	332 55.0	22 11.7	164 4.0	10 56.3	0.66250	1.30753	2.42	0.3834
	10	0.5236	0.632	0.640	333 16.3	22 13.1	163 10.7	10 52.7	0.66610	1.30719	2.55	0.4060
	11	0.5263	+0.641	+0.651	333 48.0	22 15.2	162 17.4	10 49.2	+0.67034	+1.30684	+2.68	+0.4273
	12	0.5290	0.653	0.661	334 25.5	22 17.7	161 23.9	10 45.6	0.67579	1.30647	2.80	0.4475
	13	0.5318	0.666	0.672	335 2.8	22 20.2	160 30.3	10 42.0	0.68268	1.30609	2.93	0.4668
	14	0.5345	0.682	0.682	335 33.7	22 22.2	159 36.7	10 38.4	0.69084	1.30568	3.06	0.4850
	15	0.5372	0.698	0.693	335 53.5	22 23.6	158 42.9	10 34.9	0.69980	1.30527	3.18	0.5025
	16	0.5400	+0.714	+0.703	335 59.9	22 24.0	157 49.0	10 31.3	+0.70896	+1.30484	+3.30	+0.5191
	17	0.5427	0.728	0.713	335 53.5	22 23.4	156 55.0	10 27.7	0.71766	1.30440	3.43	0.5350
	18	0.5454	0.739	0.723	335 37.3	22 22.5	156 0.9	10 24.1	0.72532	1.30394	3.55	0.5503
	19	0.5482	0.748	0.733	335 15.8	22 21.1	155 6.7	10 20.4	0.73157	1.30346	3.67	0.5649
	20	0.5509	0.754	0.744	334 54.0	22 19.6	154 12.3	10 16.8	0.73628	1.30298	3.79	0.5789
h	21	0.5537	+0.758	+0.753	334 36.8	22 18.5	153 17.8	10 13.2	+0.73964	+1.30249	+3.91	+0.5924
(20.0)	22	0.5564	0.761	0.763	334 28.4	22 17.9	152 23.1	10 9.5	0.74205	1.30198	4.03	0.6053
	23	0.5591	0.765	0.773	334 30.8	22 18.1	151 28.4	10 5.9	0.74404	1.30146	4.15	0.6178
	24	0.5619	0.770	0.783	334 43.6	22 18.9	150 33.5	10 2.2	0.74624	1.30093	4.26	0.6298
	25	0.5646	0.778	0.793	335 4.6	22 20.3	149 38.4	9 58.6	0.74925	1.30040	4.38	0.6414
	26	0.5674	+0.788	+0.802	335 29.7	22 22.0	148 43.2	9 54.9	+0.75346	+1.29984	+4.49	+0.6525
	27	0.5701	0.800	0.812	335 53.6	22 23.6	147 47.9	9 51.2	0.75899	1.29928	4.60	0.6632
	28	0.5728	0.815	0.821	336 11.4	22 24.8	146 52.4	9 47.5	0.76568	1.29872	4.72	0.6736
	29	0.5756	0.830	0.831	336 20.0	22 25.3	145 56.7	9 43.8	0.77310	1.29814	4.83	0.6836
	30	0.5783	0.844	0.840	336 18.3	22 25.2	145 0.9	9 40.1	0.78068	1.29756	4.93	0.6931
	31	0.5810	+0.857	+0.849	336 7.1	22 24.5	144 4.9	9 36.3	+0.78786	+1.29696	+5.04	+0.7026
Aug.	1	0.5838	0.868	0.858	335 49.2	22 23.3	143 8.8	9 32.6	0.79415	1.29636	5.15	0.7116
	2	0.5865	0.876	0.867	335 28.7	22 21.9	142 12.5	9 28.8	0.79929	1.29576	5.25	0.7204
	3	0.5893	0.882	0.876	335 10.1	22 20.7	141 16.0	9 25.1	0.80325	1.29515	5.36	0.7288
	4	0.5920	0.886	0.885	334 57.2	22 19.8	140 19.3	9 21.3	0.80620	1.29454	5.46	0.7370
h	5	0.5947	+0.890	+0.894	334 52.7	22 19.5	139 22.5	9 17.5	+0.80849	+1.29392	+5.56	+0.7449
(21.0)	6	0.5975	0.895	0.903	334 57.7	22 19.8	138 25.5	9 13.7	0.81057	1.29330	5.66	0.7525
	7	0.6002	0.902	0.911	335 11.4	22 20.8	137 28.2	9 9.9	0.81295	1.29268	5.75	0.7599
	8	0.6030	0.910	0.920	335 30.8	22 22.1	136 30.8	9 6.1	0.81605	1.29205	5.85	0.7670
	9	0.6057	0.922	0.928	335 51.7	22 23.4	135 33.2	9 2.2	0.82013	1.29142	5.94	0.7740
	10	0.6084	+0.935	+0.937	336 9.7	22 24.6	134 35.5	8 58.4	+0.82518	+1.29080	+6.04	+0.7806
	11	0.6112	0.949	0.945	336 21.2	22 25.4	133 37.5	8 54.5	0.83097	1.29017	6.13	0.7871
	12	0.6139	0.962	0.953	336 23.7	22 25.6	132 39.3	8 50.6	0.83709	1.28954	6.21	0.7934
	13	0.6166	0.975	0.961	336 16.9	22 25.1	131 41.0	8 46.7	0.84303	1.28892	6.30	0.7994
	14	0.6194	0.985	0.969	336 2.2	22 24.1	130 42.4	8 42.8	0.84834	1.28829	6.39	0.8053
	15	0.6221	+0.992	+0.977	335 42.4	22 22.8	129 43.7	8 38.9	+0.85268	+1.28767	+6.47	+0.8109
	16	0.6248	+0.997	+0.985	335 21.3	22 21.4	128 44.7	8 35.0	+0.85589	+1.28705	+6.55	+0.8164

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)		τ	*f*	*f'*	*G*		*H*		Log *g*.	Log *k*.	*i*	Log *i*.
			In Time.	In Time.	In Arc.	In Time.	In Arc.	In Time.				
		y	s	s	° ′	h m	° ′	h m			″	
Aug.	16	0.6248	+0.997	+0.985	335 21.3	22 21.4	128 44.7	8 35.0	+0.85589	+1.28705	+6.55	+0.8164
	17	0.6276	0.999	0.993	335 2.9	22 20.2	127 45.6	8 31.0	0.85802	1.28644	6.63	0.8217
	18	0.6303	1.001	1.001	334 50.4	22 19.4	126 46.3	8 27.1	0.85930	1.28584	6.71	0.8268
	19	0.6331	1.002	1.008	334 45.9	22 19.1	125 46.8	8 23.1	0.86011	1.28524	6.79	0.8317
h	20	0.6358	1.004	1.016	334 50.0	22 19.3	124 47.2	8 19.1	0.86092	1.28464	6.86	0.8364
(22.0)	21	0.6385	+1.009	+1.023	335 1.5	22 20.1	123 47.3	8 15.2	+0.86219	+1.28405	+6.93	+0.8410
	22	0.6413	1.016	1.031	335 17.5	22 21.1	122 47.3	8 11.2	0.86429	1.28347	7.00	0.8454
	23	0.6440	1.026	1.038	335 34.3	22 22.3	121 47.0	8 7.1	0.86743	1.28290	7.07	0.8496
	24	0.6468	1.037	1.046	335 48.0	22 23.2	120 46.6	8 3.1	0.87155	1.28234	7.14	0.8537
	25	0.6495	1.050	1.053	335 55.6	22 23.7	119 46.1	7 59.1	0.87637	1.28180	7.20	0.8576
	26	0.6522	+1.063	+1.060	335 55.5	22 23.7	118 45.3	7 55.0	+0.88150	+1.28126	+7.27	+0.8614
	27	0.6550	1.074	1.067	335 47.8	22 23.2	117 44.4	7 51.0	0.88650	1.28073	7.33	0.8650
	28	0.6577	1.083	1.074	335 34.1	22 22.3	116 43.3	7 46.9	0.89095	1.28022	7.39	0.8685
	29	0.6604	1.090	1.081	335 17.3	22 21.2	115 42.0	7 42.8	0.89456	1.27971	7.44	0.8718
	30	0.6632	1.094	1.088	335 0.9	22 20.1	114 40.6	7 38.7	0.89723	1.27923	7.50	0.8749
	31	0.6659	+1.096	+1.094	334 48.4	22 19.2	113 39.0	7 34.6	+0.89903	+1.27885	+7.55	+0.8780
Sept.	1	0.6687	1.098	1.101	334 42.3	22 18.8	112 37.3	7 30.5	0.90019	1.27830	7.60	0.8808
	2	0.6714	1.101	1.108	334 43.9	22 18.9	111 35.3	7 26.4	0.90105	1.27785	7.65	0.8836
	3	0.6741	1.105	1.114	334 53.0	22 19.5	110 33.3	7 22.2	0.90203	1.27743	7.69	0.8862
h	4	0.6769	1.111	1.121	335 8.1	22 20.5	109 31.0	7 18.1	0.90352	1.27702	7.74	0.8886
(23.0)	5	0.6796	+1.120	+1.128	335 26.2	22 21.8	108 28.6	7 13.9	+0.90578	+1.27663	+7.78	+0.8909
	6	0.6824	1.130	1.134	335 43.5	22 22.9	107 26.1	7 9.7	0.90890	1.27626	7.82	0.8931
	7	0.6851	1.142	1.140	335 56.5	22 23.8	106 23.5	7 5.6	0.91273	1.27590	7.86	0.8952
	8	0.6878	1.154	1.147	336 2.8	22 24.2	105 20.7	7 1.4	0.91697	1.27557	7.89	0.8971
	9	0.6906	1.166	1.153	336 1.5	22 24.1	104 17.7	6 57.2	0.92123	1.27525	7.92	0.8989
	10	0.6933	+1.175	+1.159	335 53.3	22 23.5	103 14.7	6 53.0	+0.92512	+1.27496	+7.95	+0.9005
	11	0.6960	1.181	1.166	335 40.1	22 22.7	102 11.5	6 48.8	0.92831	1.27469	7.98	0.9021
	12	0.6988	1.185	1.172	335 24.8	22 21.7	101 8.2	6 44.5	0.93060	1.27443	8.01	0.9035
	13	0.7015	1.187	1.178	335 10.7	22 20.7	100 4.8	6 40.3	0.93195	1.27420	8.03	0.9047
	14	0.7042	1.187	1.184	335 0.8	22 20.1	99 1.3	6 36.1	0.93251	1.27399	8.05	0.9059
	15	0.7070	+1.186	+1.190	334 57.5	22 19.8	97 57.7	6 31.8	+0.93257	+1.27381	+8.07	+0.9069
	16	0.7097	1.187	1.197	335 1.7	22 20.1	96 54.0	6 27.6	0.93251	1.27364	8.09	0.9078
	17	0.7125	1.189	1.203	335 12.8	22 20.9	95 50.3	6 23.4	0.93272	1.27350	8.10	0.9085
	18	0.7152	1.194	1.209	335 28.9	22 21.9	94 46.5	6 19.1	0.93358	1.27338	8.11	0.9092
	19	0.7179	1.202	1.215	335 46.9	22 23.1	93 42.6	6 14.8	0.93532	1.27329	8.12	0.9097
h	20	0.7207	+1.212	+1.221	336 3.4	22 24.2	92 38.6	6 10.6	+0.93794	+1.27322	+8.13	+0.9100
(0.0)	21	0.7234	1.223	1.227	336 15.6	22 25.0	91 34.6	6 6.3	0.94126	1.27317	8.13	0.9103
	22	0.7262	1.234	1.233	336 21.6	22 25.4	90 30.6	6 2.0	0.94499	1.27315	8.14	0.9104
	23	0.7289	1.245	1.239	336 20.9	22 25.4	89 26.5	5 57.8	0.94878	1.27315	8.14	0.9104
	24	0.7316	1.254	1.245	336 14.6	22 25.0	88 22.4	5 53.5	0.95222	1.27318	8.13	0.9103
	25	0.7344	+1.260	+1.251	336 4.8	22 24.3	87 18.3	5 49.2	+0.95502	+1.27322	+8.13	+0.9100
	26	0.7371	1.265	1.258	335 54.5	22 23.6	86 14.2	5 44.9	0.95705	1.27330	8.12	0.9096
	27	0.7398	1.267	1.264	335 46.7	22 23.1	85 10.1	5 40.7	0.95830	1.27339	8.11	0.9091
	28	0.7426	1.268	1.270	335 44.1	22 22.9	84 6.0	5 36.4	0.95895	1.27351	8.10	0.9085
	29	0.7453	1.270	1.276	335 48.2	22 23.2	83 1.8	5 32.1	0.95927	1.27365	8.09	0.9077
	30	0.7481	+1.273	+1.282	335 59.3	22 24.0	81 57.7	5 27.8	+0.95962	+1.27382	+8.07	+0.9068
Oct.	1	0.7508	+1.278	+1.288	336 16.3	22 25.1	80 53.6	5 23.6	+0.96037	+1.27401	+8.05	+0.9058

(CONSTANTS OF STRUVE AND PETERS.)

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)		τ	f	f′	G		H		Log g.	Log h.	i	Log i.
			In Time.	In Time.	In Arc.	In Time.	In Arc.	In Time.				
		y	s	s	° ′	h m	° ′	h m			″	
Oct.	1	0.7508	+1.278	+1.288	336 16.3	22 25.1	80 53.6	5 23.6	+0.96037	+1.27401	+8.05	+0.9058
	2	0.7535	1.285	1.294	336 36.8	22 26.5	79 49.5	5 19.3	0.96177	1.27422	8.03	0.9046
	3	0.7563	1.295	1.301	336 57.6	22 27.8	78 45.4	5 15.0	0.96393	1.27446	8.00	0.9033
	4	0.7590	1.307	1.307	337 15.7	22 29.0	77 41.4	5 10.8	0.96681	1.27472	7.98	0.9019
	5	0.7618	1.319	1.313	337 28.4	22 29.9	76 37.4	5 6.5	0.97018	1.27500	7.95	0.9003
h (1.0)	6	0.7645	+1.331	+1.320	337 34.5	22 30.3	75 33.4	5 2.2	+0.97370	+1.27530	+7.92	+0.8986
	7	0.7672	1.341	1.326	337 34.1	22 30.3	74 29.5	4 58.0	0.97700	1.27562	7.88	0.8968
	8	0.7700	1.348	1.333	337 28.7	22 29.9	73 25.7	4 53.7	0.97976	1.27596	7.85	0.8948
	9	0.7727	1.354	1.339	337 20.8	22 29.4	72 21.9	4 49.5	0.98179	1.27633	7.81	0.8927
	10	0.7754	1.356	1.346	337 13.1	22 28.9	71 18.2	4 45.2	0.98301	1.27671	7.77	0.8905
	11	0.7782	+1.357	+1.352	337 8.5	22 28.6	70 14.6	4 41.0	+0.98350	+1.27711	+7.73	+0.8881
	12	0.7809	1.357	1.359	337 9.4	22 28.6	69 11.0	4 36.7	0.98347	1.27753	7.68	0.8855
	13	0.7836	1.358	1.366	337 17.1	22 29.2	68 7.5	4 32.5	0.98326	1.27798	7.64	0.8828
	14	0.7864	1.360	1.372	337 31.3	22 30.1	67 4.0	4 28.3	0.98327	1.27844	7.58	0.8800
	15	0.7891	1.365	1.380	337 50.4	22 31.4	66 0.8	4 24.1	0.98382	1.27891	7.53	0.8770
	16	0.7919	+1.372	+1.386	338 11.8	22 32.8	64 57.7	4 19.8	+0.98512	+1.27940	+7.48	+0.8738
	17	0.7946	1.382	1.393	338 32.6	22 34.2	63 54.6	4 15.6	0.98725	1.27990	7.42	0.8705
	18	0.7973	1.394	1.400	338 50.0	22 35.3	62 51.7	4 11.4	0.99010	1.28042	7.36	0.8671
	19	0.8001	1.407	1.407	339 2.0	22 36.1	61 48.9	4 7.2	0.99342	1.28096	7.30	0.8634
	20	0.8028	1.419	1.414	339 7.9	22 36.5	60 46.2	4 3.1	0.99687	1.28151	7.24	0.8596
h (2.0)	21	0.8056	+1.430	+1.422	339 8.3	22 36.6	59 43.6	3 58.9	+1.00011	+1.28207	+7.17	+0.8557
	22	0.8083	1.438	1.429	339 5.1	22 36.3	58 41.1	3 54.8	1.00286	1.28264	7.10	0.8516
	23	0.8110	1.444	1.437	339 0.7	22 36.0	57 38.9	3 50.6	1.00495	1.28323	7.04	0.8473
	24	0.8138	1.449	1.444	338 57.8	22 35.9	56 36.7	3 46.4	1.00636	1.28382	6.96	0.8428
	25	0.8165	1.452	1.452	338 59.1	22 35.9	55 34.7	3 42.3	1.00723	1.28442	6.89	0.8381
	26	0.8192	+1.455	+1.460	339 6.2	22 36.4	54 32.9	3 38.2	+1.00779	+1.28504	+6.81	+0.8333
	27	0.8220	1.459	1.467	339 19.6	22 37.3	53 31.1	3 34.1	1.00834	1.28566	6.73	0.8282
	28	0.8247	1.465	1.475	339 38.5	22 38.5	52 29.5	3 30.0	1.00922	1.28629	6.65	0.8230
	29	0.8275	1.473	1.483	340 0.9	22 40.1	51 28.1	3 25.9	1.01068	1.28692	6.57	0.8176
	30	0.8302	1.484	1.491	340 24.1	22 41.6	50 26.8	3 21.8	1.01284	1.28756	6.48	0.8119
	31	0.8329	+1.497	+1.500	340 45.0	22 43.0	49 25.7	3 17.7	+1.01568	+1.28821	+6.40	+0.8061
Nov.	1	0.8357	1.511	1.508	341 1.6	22 44.1	48 24.7	3 13.6	1.01903	1.28886	6.31	0.8000
	2	0.8384	1.525	1.516	341 12.2	22 44.8	47 23.9	3 9.6	1.02260	1.28951	6.22	0.7937
	3	0.8412	1.538	1.524	341 16.8	22 45.1	46 23.2	3 5.5	1.02605	1.29016	6.13	0.7872
	4	0.8439	1.549	1.533	341 16.4	22 45.1	45 22.6	3 1.5	1.02908	1.29082	6.03	0.7804
h (3.0)	5	0.8466	+1.557	+1.542	341 13.0	22 44.9	44 22.2	2 57.5	+1.03148	+1.29147	+5.94	+0.7734
	6	0.8494	1.563	1.550	341 9.4	22 44.6	43 22.0	2 53.5	1.03316	1.29213	5.84	0.7662
	7	0.8521	1.566	1.559	341 8.0	22 44.5	42 21.9	2 49.5	1.03418	1.29278	5.74	0.7586
	8	0.8548	1.568	1.568	341 11.1	22 44.7	41 21.9	2 45.5	1.03473	1.29344	5.63	0.7508
	9	0.8576	1.571	1.577	341 19.8	22 45.3	40 22.1	2 41.5	1.03510	1.29409	5.53	0.7428
	10	0.8603	+1.575	+1.586	341 34.1	22 46.3	39 22.4	2 37.5	+1.03561	+1.29474	+5.43	+0.7344
	11	0.8630	1.582	1.596	341 53.0	22 47.5	38 22.9	2 33.5	1.03657	1.29538	5.32	0.7257
	12	0.8658	1.591	1.605	342 14.2	22 48.9	37 23.6	2 29.6	1.03819	1.29602	5.21	0.7167
	13	0.8685	1.603	1.614	342 35.1	22 50.3	36 24.3	2 25.6	1.04055	1.29665	5.10	0.7074
	14	0.8713	1.616	1.624	342 53.1	22 51.5	35 25.2	2 21.7	1.04357	1.29728	4.98	0.6977
	15	0.8740	+1.631	+1.634	343 6.3	22 52.4	34 26.3	2 17.7	+1.04704	+1.29790	+4.87	+0.6876
	16	0.8767	+1.646	+1.643	343 13.9	22 52.9	33 27.6	2 13.8	+1.05070	+1.29851	+4.76	+0.6772

(CONSTANTS OF STRUVE AND PETERS.)

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)		τ	f	f′	G		H		Log g.	Log h.	i	Log i.
			In Time.	In Time.	In Arc.	In Time.	In Arc.	In Time.				
		y	s	s	° ′	h m	° ′	h m			″	
Nov.	16	0.8767	+1.646	+1.643	343 13.9	22 52.9	33 27.6	2 13.8	+1.05070	+1.29851	+4.76	+0.6772
	17	0.8795	1.660	1.653	343 16.3	22 53.1	32 28.9	2 9.9	1.05423	1.29911	4.64	0.6664
	18	0.8822	1.672	1.663	343 14.8	22 53.0	31 30.4	2 6.0	1.05737	1.29970	4.52	0.6553
	19	0.8850	1.681	1.673	343 11.6	22 52.8	30 32.1	2 2.1	1.05995	1.30029	4.40	0.6435
h	20	0.8877	1.689	1.683	343 9.3	22 52.6	29 33.8	1 58.3	1.06193	1.30086	4.28	0.6314
(4.0)	21	0.8904	+1.695	+1.693	343 10.1	22 52.7	28 35.7	1 54.4	+1.06342	+1.30142	+4.16	+0.6187
	22	0.8932	1.700	1.704	343 15.6	22 53.0	27 37.8	1 50.5	1.06462	1.30198	4.03	0.6056
	23	0.8959	1.706	1.714	343 26.4	22 53.7	26 39.9	1 46.6	1.06579	1.30251	3.91	0.5918
	24	0.8986	1.714	1.724	343 42.0	22 54.8	25 42.3	1 42.8	1.06719	1.30304	3.78	0.5775
	25	0.9014	1.724	1.735	344 0.8	22 56.1	24 44.7	1 39.0	1.06906	1.30354	3.65	0.5626
	26	0.9041	+1.737	+1.746	344 20.6	22 57.4	23 47.2	1 35.1	+1.07154	+1.30404	+3.52	+0.5470
	27	0.9069	1.752	1.756	344 38.8	22 58.6	22 49.8	1 31.3	1.07463	1.30452	3.39	0.5306
	28	0.9096	1.769	1.767	344 53.2	22 59.5	21 52.5	1 27.5	1.07820	1.30499	3.26	0.5135
	29	0.9123	1.785	1.778	345 2.4	23 0.2	20 55.4	1 23.7	1.08199	1.30544	3.13	0.4955
	30	0.9151	1.801	1.789	345 6.1	23 0.4	19 58.3	1 19.9	1.08571	1.30587	3.00	0.4766
Dec.	1	0.9178	+1.815	+1.800	345 5.0	23 0.3	19 1.3	1 16.1	+1.08910	+1.30629	+2.86	+0.4567
	2	0.9206	1.827	1.811	345 0.9	23 0.1	18 4.4	1 12.3	1.09196	1.30669	2.73	0.4357
	3	0.9233	1.836	1.822	344 55.9	22 59.7	17 7.6	1 8.5	1.09419	1.30707	2.59	0.4134
	4	0.9260	1.842	1.833	344 52.4	22 59.5	16 10.9	1 4.7	1.09582	1.30744	2.45	0.3898
h	5	0.9288	1.847	1.844	344 52.2	22 59.5	15 14.2	1 0.9	1.09701	1.30778	2.32	0.3647
(5.0)	6	0.9315	+1.852	+1.856	344 56.6	22 59.8	14 17.6	0 57.2	+1.09798	+1.30811	+2.18	+0.3379
	7	0.9342	1.858	1.867	345 5.8	23 0.4	13 21.1	0 53.4	1.09900	1.30842	2.04	0.3092
	8	0.9370	1.865	1.878	345 19.0	23 1.3	12 24.6	0 49.6	1.10035	1.30871	1.90	0.2783
	9	0.9397	1.875	1.890	345 34.4	23 2.3	11 28.2	0 45.9	1.10223	1.30898	1.76	0.2448
	10	0.9424	1.888	1.901	345 49.8	23 3.3	10 31.9	0 42.1	1.10473	1.30923	1.62	0.2084
	11	0.9452	+1.904	+1.913	346 3.0	23 4.2	9 35.5	0 38.4	+1.10781	+1.30946	+1.47	+0.1685
	12	0.9479	1.920	1.924	346 12.2	23 4.8	8 39.3	0 34.6	1.11130	1.30967	1.33	0.1244
	13	0.9507	1.937	1.936	346 16.5	23 5.1	7 43.0	0 30.9	1.11496	1.30985	1.19	0.0752
	14	0.9534	1.953	1.948	346 16.0	23 5.1	6 46.8	0 27.1	1.11854	1.31002	1.05	0.0195
	15	0.9561	1.967	1.959	346 11.7	23 4.8	5 50.7	0 23.4	1.12182	1.31016	0.90	9.9554
	16	0.9589	+1.980	+1.971	346 5.4	23 4.4	4 54.6	0 19.6	+1.12464	+1.31029	+0.76	+9.8800
	17	0.9616	1.989	1.983	345 59.3	23 4.0	3 58.5	0 15.9	1.12694	1.31039	0.61	9.7884
	18	0.9644	1.997	1.994	345 55.3	23 3.7	3 2.3	0 12.2	1.12877	1.31047	0.47	9.6722
	19	0.9671	2.004	2.006	345 55.0	23 3.7	2 6.3	0 8.4	1.13028	1.31054	0.33	9.5128
h	20	0.9698	2.011	2.018	345 59.2	23 3.9	1 10.3	0 4.7	1.13170	1.31057	0.18	9.2580
(6.0)	21	0.9726	+2.020	+2.030	346 7.7	23 4.5	0 14.2	0 0.9	+1.13327	+1.31059	+0.04	+8.5624
	22	0.9753	2.030	2.041	346 19.3	23 5.3	359 18.1	23 57.2	1.13519	1.31058	−0.11	−9.0339
	23	0.9780	2.043	2.053	346 32.0	23 6.1	358 22.0	23 53.5	1.13760	1.31056	0.25	9.4026
	24	0.9808	2.059	2.065	346 43.8	23 6.9	357 25.9	23 49.7	1.14052	1.31051	0.40	9.5991
	25	0.9835	2.076	2.076	346 52.8	23 7.5	356 29.8	23 46.0	1.14385	1.31044	0.54	9.7339
	26	0.9863	+2.094	+2.088	346 57.5	23 7.8	355 33.7	23 42.2	+1.14740	+1.31034	−0.69	−9.8363
	27	0.9890	2.111	2.100	346 57.5	23 7.8	354 37.6	23 38.5	1.15093	1.31023	0.83	9.9191
	28	0.9917	2.126	2.111	346 53.2	23 7.6	353 41.4	23 34.8	1.15422	1.31010	0.97	9.9884
	29	0.9945	2.139	2.123	346 45.8	23 7.1	352 45.1	23 31.0	1.15708	1.30994	1.12	0.0482
	30	0.9972	2.149	2.135	346 37.1	23 6.5	351 48.8	23 27.3	1.15940	1.30976	1.26	0.1005
	31	1.0000	+2.157	+2.146	346 29.1	23 5.9	350 52.5	23 23.5	+1.16116	+1.30956	−1.40	−0.1471
	32	1.0027	+2.163	+2.158	346 23.5	23 5.6	349 56.1	23 19.7	+1.16246	+1.30934	−1.55	−0.1891

(CONSTANTS OF STRUVE AND PETERS.)

FOR WASHINGTON SIDEREAL TWELVE HOURS.

Mean Solar Date.	Log A'.	Log B'.	Log C.	Log D.	f'	G'	H	Log g'.	Log h.	Log i.
					s	° ′	° ′			
Jan. 0.72	− 9.5189	− 9.5515	− 0.5300	+ 1.3034	− 1.018	183 5	350 26	+ 0.8217	+ 1.3095	− 0.1673
10.69	9.4691	9.7334	0.8189	1.2820	0.908	185 14	341 0	0.7731	1.3063	0.4563
20.67	9.4163	9.8908	0.9815	1.2449	0.804	188 28	331 24	0.7231	1.3014	0.6188
30.64	9.3613	0.0200	1.0889	1.1893	0.709	192 48	321 34	0.6744	1.2954	0.7263
Feb. 9.61	9.3052	0.1225	1.1634	1.1097	0.623	198 8	311 28	0.6294	1.2888	0.8008
19.58	− 9.2482	− 0.2013	− 1.2151	+ 0.9956	− 0.547	204 7	301 6	+ 0.5900	+ 1.2825	− 0.8524
Mar. 1.56	9.1900	0.2594	1.2490	0.8218	0.479	210 20	290 30	0.5561	1.2774	0.8863
11.53	9.1290	0.2992	1.2678	+ 0.5030	0.416	216 26	279 45	0.5255	1.2741	0.9051
21.50	9.0615	0.3228	1.2731	− 9.5346	0.357	222 19	268 57	0.4947	1.2731	0.9104
31.47	8.9811	0.3323	1.2653	0.5844	0.297	228 14	258 14	0.4597	1.2746	0.9026
Apr. 10.45	− 8.8762	− 0.3296	− 1.2443	− 0.8576	− 0.234	234 47	247 41	+ 0.4174	+ 1.2782	− 0.8816
20.42	8.7223	0.3171	1.2089	1.0146	0.165	242 59	237 25	0.3672	1.2833	0.8462
30.39	8.4448	0.2976	1.1568	1.1195	0.089	254 17	227 28	0.3142	1.2894	0.7942
May 10.37	− 6.2041	0.2749	1.0835	1.1932	− 0.004	269 54	217 51	0.2749	1.2957	0.7208
20.34	+ 8.4810	0.2536	0.9805	1.2452	+ 0.090	288 42	208 32	0.2771	1.3015	0.6178
30.31	+ 8.8001	− 0.2385	− 0.8289	− 1.2805	+ 0.191	306 10	199 28	+ 0.3314	+ 1.3061	− 0.4661
June 9.28	8.9902	0.2344	0.5740	1.3017	0.298	318 49	190 36	0.4158	1.3092	0.2113
19.26	9.1255	0.2442	− 9.8173	1.3103	0.408	326 46	181 50	0.5053	1.3105	− 9.4547
29.23	9.2290	0.2680	+ 0.3890	1.3069	0.518	331 23	173 7	0.5877	1.3100	+ 0.0264
July 9.20	9.3112	0.3031	0.7391	1.2912	0.626	333 55	164 20	0.6600	1.3076	0.3764
19.17	+ 9.3774	− 0.3454	+ 0.9230	− 1.2623	+ 0.730	335 9	155 24	+ 0.7218	+ 1.3036	+ 0.5603
29.15	9.4315	0.3904	1.0429	1.2183	0.827	335 36	146 16	0.7743	1.2983	0.6802
Aug. 8.12	9.4759	0.4341	1.1271	1.1555	0.917	335 38	136 52	0.8186	1.2923	0.7645
18.09	9.5125	0.4737	1.1874	1.0672	0.997	335 29	127 10	0.8557	1.2861	0.8248
28.07	9.5432	0.5071	1.2297	0.9398	1.071	335 21	117 10	0.8868	1.2804	0.8670
Sept. 7.04	+ 9.5694	− 0.5332	+ 1.2569	− 0.7388	+ 1.138	335 21	106 52	+ 0.9130	+ 1.2760	+ 0.8943
17.01	9.5925	0.5513	1.2709	− 0.3176	1.200	335 36	96 21	0.9353	1.2736	0.9082
26.98	9.6139	0.5615	1.2721	+ 0.1467	1.261	336 9	85 43	0.9548	1.2733	0.9094
Oct. 6.96	9.6348	0.5640	1.2605	0.6866	1.323	337 2	75 4	0.9729	1.2754	0.8978
16.93	9.6561	0.5595	1.2351	0.9135	1.389	338 14	64 30	0.9903	1.2796	0.8725
26.90	+ 9.6784	− 0.5496	+ 1.1939	+ 1.0531	+ 1.463	339 40	54 8	+ 1.0085	+ 1.2853	+ 0.8312
Nov. 5.87	9.7022	0.5360	1.1334	1.1487	1.545	341 13	44 0	1.0281	1.2917	0.7707
15.85	9.7273	0.5215	1.0467	1.2162	1.637	342 45	34 6	1.0494	1.2981	0.6840
25.82	9.7533	0.5090	0.9203	1.2630	1.739	344 8	24 26	1.0723	1.3037	0.5576
Dec. 5.79	9.7797	0.5017	0.7196	1.2929	1.848	345 16	14 57	1.0964	1.3079	0.3570
15.77	+ 9.8058	− 0.5021	+ 0.2993	+ 1.3081	+ 1.962	346 5	5 36	+ 1.1209	+ 1.3102	+ 9.9365
25.74	9.8309	0.5116	− 0.1234	1.3095	2.079	346 33	356 16	1.1451	1.3104	− 9.7606
35.71	+ 9.8543	− 0.5297	− 0.6636	+ 1.2971	+ 2.195	346 43	346 54	+ 1.1684	+ 1.3085	− 0.3010

$E = -0^s.003$

The above numbers give the same reductions from mean to apparent place as are employed in computing the apparent places of the fixed stars, given on pages 324–399, from the mean places, given on pages 304–311. In order to render exact interpolation possible through intervals of ten days, all short period terms have been omitted.

MEAN PLACES FOR 1909.0. (January 0ᵈ.279, Washington.)

Name of Star.	Magnitude.	Right Ascension.			Annual Variation.	Declination.			Annual Variation.
		h	m	s	s	°	′	″	″
33 Piscium	4.7	0	0	40.683	+ 3.0715	− 6	12	59.86	+ 20.137
α Andromedæ	2.1	0	3	40.877	3.0949	+ 28	35	16.95	19.881
β Cassiopeiæ	2.4	0	4	18.956	3.1818	+ 58	38	52.38	19.862
22 Andromedæ	4.9	0	5	35.246	3.1078	+ 45	33	57.17	20.036
γ Pegasi (*Algenib*)	2.8	0	8	32.903	3.0858	+ 14	40	39.68	20.022
σ Andromedæ	4.4	0	13	34.234	+ 3.1261	+ 36	16	50.63	+ 19.964
ι Ceti	3.6	0	14	47.503	3.0571	− 9	19	41.96	19.975
44 Piscium	5.8	0	20	44.242	3.0741	+ 1	26	8.68	19.941
β Hydri	2.8	0	20	59.001	3.2088	− 77	46	0.32	20.280
12 Ceti	6.0	0	25	23.698	3.0621	− 4	27	36.01	19.923
π Andromedæ	4.4	0	32	1.042	+ 3.1963	+ 33	13	6.67	+ 19.851
α Cassiopeiæ (*var.*)	2.3	0	35	20.186	3.3835	+ 56	2	18.22	19.776
β Ceti	2.2	0	39	1.343	3.0128	− 18	29	9.20	19.798
21 Cassiopeiæ	5.7	0	39	37.289	3.8959	+ 74	29	26.91	19.721
ο Cassiopeiæ	4.7	0	39	38.972	3.3289	+ 47	47	11.39	19.741
δ Piscium	4.8	0	43	57.592	+ 3.1096	+ 7	5	23.94	+ 19.634
γ Cassiopeiæ	2.3	0	51	12.459	3.5936	+ 60	13	26.94	19.542
μ Andromedæ	4.0	0	51	41.896	3.3193	+ 38	0	21.29	19.568
43 Cephei (H.)	4.6	0	56	8.595	7.5262	+ 85	46	9.84	19.444
ε Piscium	4.3	0	58	13.142	3.1107	+ 7	24	1.35	19.428
β Andromedæ	2.2	1	4	37.961	+ 3.3490	+ 35	8	17.80	+ 19.137
κ Tucanæ	4.9	1	12	40.990	2.0406	− 69	21	34.32	19.135
f Piscium	5.1	1	13	6.248	3.0921	+ 3	8	7.62	19.009
θ^1 Ceti	3.6	1	19	28.462	2.9977	− 8	39	9.74	18.638
38 Cassiopeiæ	5.9	1	24	26.513	4.4067	+ 69	47	47.98	18.629
α Ursæ Minoris (*Polaris*)	2.2	1	26	28.63*	+ 27.1356	+ 88	49	14.93	+ 18.639
η Piscium	3.7	1	26	36.691	3.2050	+ 14	52	37.09	18.629
υ Andromedæ	4.2	1	31	27.073	3.5078	+ 40	57	2.18	18.095
π Piscium	5.5	1	32	16.340	3.1758	+ 11	40	34.58	18.478
α Eridani (*Achernar*)	0.4	1	34	19.559	2.2371	− 57	41	56.27	18.331
ν Piscium	4.6	1	36	41.661	+ 3.1192	+ 5	1	38.68	+ 18.291
ο Piscium	4.4	1	40	35.198	3.1643	+ 8	41	59.99	18.191
ζ Ceti	3.6	1	46	58.103	2.9599	− 10	47	3.36	17.875
β Arietis	2.8	1	49	36.593	3.3072	+ 20	21	48.63	17.686
50 Cassiopeiæ	4.1	1	55	38.569	5.0495	+ 71	58	53.08	17.568
γ Andromedæ	2.2	1	58	18.500	+ 3.6689	+ 41	53	36.48	+ 17.383
α Arietis	2.1	2	2	2.423	3.3749	+ 23	1	57.06	17.127
β Trianguli	3.1	2	4	7.478	3.5596	+ 34	33	26.01	17.133
ξ^1 Ceti	4.5	2	8	10.496	3.1762	+ 8	25	12.36	16.975
γ Trianguli	4.3	2	11	54.028	3.5566	+ 33	25	36.20	16.765
67 Ceti	5.6	2	12	26.609	+ 2.9903	− 6	50	28.40	+ 16.680
δ Hydri	4.2	2	20	7.555	1.0566	− 69	4	23.92	16.434
ι Cassiopeiæ	4.6	2	21	33.307	4.8950	+ 66	59	37.81	16.353
ξ^2 Ceti	4.5	2	23	19.128	+ 3.1857	+ 8	3	9.31	16.246
μ Hydri	5.3	2	33	34.568	− 1.3659	− 79	30	23.53	15.674
δ Ceti	4.1	2	34	49.023	+ 3.0726	− 0	3	48.84	+ 15.648
θ Persei	4.2	2	37	58.702	4.0802	+ 48	50	38.82	15.382
γ Ceti	3.6	2	38	35.031	+ 3.1054	+ 2	51	9.77	+ 15.285

MEAN PLACES FOR 1909.0. (January $0^{d}.279$, Washington.)

Name of Star.	Magnitude.	Right Ascension.	Annual Variation.	Declination.	Annual Variation.
		h m s	s	° ′ ″	″
σ Arietis	5.5	2 46 27.966	+ 3.3071	+ 14 42 26.79	+ 14.952
47 Cephei (H.)	5.7	2 53 56.897	7.8205	+ 79 3 36.34	14.554
ε Arietis	4.6	2 54 0.335	3.4243	+ 20 58 36.54	14.531
α Ceti	2.6	2 57 31.259	3.1326	+ 3 43 59.41	14.249
β Persei (*Algol*) (*var.*)	2.3	3 2 14.582	3.8913	+ 40 36 20.29	14.033
48 Cephei (H.)	5.5	3 8 44.414	+ 7.4792	+ 77 24 5.13	+ 13.569
ζ Arietis	4.8	3 9 40.084	3.4426	+ 20 42 27.52	13.482
α Persei	1.9	3 17 49.191	+ 4.2661	+ 49 32 16.58	13.003
ι Hydri	5.7	3 18 12.494	− 1.5650	− 77 43 16.09	13.045
f Tauri	4.3	3 25 50.834	+ 3.3082	+ 12 37 31.30	12.491
ε Eridani	3.7	3 28 38.541	+ 2.8249	− 9 45 56.69	+ 12.323
δ Persei	3.1	3 36 26.431	4.2575	+ 47 29 50.11	11.715
γ Camelopardalis	4.6	3 40 44.215	6.2744	+ 71 3 9.67	11.388
η Tauri	3.1	3 42 4.353	3.5605	+ 23 49 27.46	11.299
ζ Persei	3.0	3 48 24.515	+ 3.7642	+ 31 36 50.39	10.874
γ Hydri	3.3	3 48 38.253	− 0.9716	− 74 31 4.88	+ 10.988
ε Persei	3.0	3 51 44.637	+ 4.0175	+ 39 44 51.47	10.615
γ Eridani	3.0	3 53 47.003	2.7982	− 13 46 0.85	10.380
A^1 Tauri	4.6	3 59 18.795	3.5424	+ 21 50 1.97	10.017
c Persei	4.3	4 2 3.074	4.3449	+ 47 28 12.88	9.835
o^1 Eridani	4.2	4 7 25.371	+ 2.9270	− 7 4 27.46	+ 9.541
γ Tauri	3.8	4 14 36.786	3.4109	+ 15 24 30.50	8.870
ε Tauri	3.6	4 23 18.082	+ 3.5000	+ 18 58 45.18	8.175
δ Mensæ	5.6	4 24 6.207	− 4.1643	− 80 25 39.72	8.217
m Persei	6.0	4 27 0.540	+ 4.2135	+ 42 52 12.85	7.916
α Tauri (*Aldebaran*)	1.0	4 30 41.840	+ 3.4394	+ 16 19 37.05	+ 7.426
τ Tauri	4.5	4 36 46.905	3.5979	+ 22 46 58.69	7.101
α Camelopardalis	4.4	4 44 59.863	5.9441	+ 66 11 20.94	6.449
i Tauri	5.2	4 46 2.951	3.5070	+ 18 41 8.19	6.322
ι Aurigæ	2.8	4 51 3.927	3.9030	+ 33 1 21.73	5.918
ζ Aurigæ	3.9	4 56 6.889	+ 4.1885	+ 40 56 37.67	+ 5.494
11 Orionis	4.7	4 59 22.091	3.4262	+ 15 16 40.81	5.206
β Eridani	2.9	5 3 22.555	2.9489	− 5 12 12.52	4.828
α Aurigæ (*Capella*)	0.1	5 9 57.879	4.4278	+ 45 54 22.56	3.913
β Orionis (*Rigel*)	0.3	5 10 9.834	2.8820	− 8 18 22.31	4.325
τ Orionis	3.8	5 13 11.252	+ 2.9123	− 6 56 31.83	+ 4.061
β Tauri	1.8	5 20 32.306	3.7908	+ 28 31 52.63	3.258
χ Aurigæ	5.0	5 26 48.240	3.9035	+ 32 7 31.46	2.880
δ Orionis (*var.*)	2.3	5 27 21.424	3.0640	− 0 21 57.29	2.843
Groombridge 966	6.4	5 27 33.005	8.0048	+ 74 59 6.03	2.846
α Leporis	2.7	5 28 42.991	+ 2.6455	− 17 53 12.95	+ 2.727
ε Orionis	1.8	5 31 35.728	3.0433	− 1 15 33.90	2.479
Groombridge 944	6.4	5 32 42.760	18.7349	+ 85 9 12.10	2.377
α Columbæ	2.7	5 36 21.230	2.1723	− 34 7 20.10	2.026
κ Orionis	2.3	5 43 26.427	2.8447	− 9 42 5.08	1.444
δ Doradus	4.4	5 44 36.497	+ 0.1017	− 65 46 10.75	+ 1.344
ν Aurigæ	4.1	5 45 10.940	4.1570	+ 39 7 21.41	1.308
α Orionis (*var.*)	0.9	5 50 14.700	+ 3.2477	+ 7 23 26.57	+ 0.862

MEAN PLACES FOR 1909.0. (January $0^d.279$, Washington.)

Name of Star.	Magnitude.	Right Ascension.			Annual Variation.	Declination.			Annual Variation.
		h	m	s	s	°	′	″	″
β Aurigæ	2.0	5	52	51.250	+ 4.4016	+ 44	56	20.47	+ 0.619
θ Aurigæ	2.9	5	53	30.952	4.0915	+ 37	12	24.94	+ 0.476
ν Orionis	4.5	6	2	22.599	3.4263	+ 14	46	47.82	− 0.233
22 Camelopardalis (H.)	4.7	6	8	49.276	6.6191	+ 69	21	10.85	0.885
η Geminorum	3.5	6	9	23.117	3.6227	+ 22	32	1.78	0.837
μ Geminorum	3.2	6	17	27.340	+ 3.6308	+ 22	33	39.59	− 1.640
ψ^1 Aurigæ	5.1	6	17	53.530	4.6263	+ 49	20	6.77	1.567
α Argûs (*Canopus*)	−0.8	6	21	55.910	1.3318	− 52	38	44.73	1.907
ν Geminorum	4.2	6	23	33.601	3.5630	+ 20	16	13.50	2.073
γ Geminorum	2.0	6	32	27.327	3.4671	+ 16	28	39.25	2.877
ε Geminorum	3.2	6	38	20.046	+ 3.6931	+ 25	13	18.97	− 3.355
ψ^5 Aurigæ	5.4	6	40	10.980	4.3304	+ 43	40	7.59	3.337
† α Canis Majoris (*Sirius*)	−1.4	6	41	8.286	2.6435	− 16	35	26.98	4.786
θ Geminorum	3.7	6	46	47.579	+ 3.9586	+ 34	4	18.12	4.115
ζ Mensæ	5.6	6	47	38.055	− 4.9327	− 80	43	5.95	4.055
ε Canis Majoris	1.5	6	55	2.958	+ 2.3574	− 28	50	51.86	− 4.766
51 Cephei (H.)	5.3	6	58	9.74*	29.4034	+ 87	11	36.60	5.068
ζ Geminorum (*var.*)	4.0	6	58	42.762	3.5610	+ 20	42	15.90	5.087
δ Canis Majoris	1.9	7	4	41.426	2.4381	− 26	14	53.62	5.580
63 Aurigæ	5.2	7	5	23.925	+ 4.1337	+ 39	28	11.04	5.646
γ^2 Volantis (*var.*)	3.9	7	9	31.284	− 0.4992	− 70	21	4.43	− 5.911
25 Camelopardalis (H.)	5.3	7	11	59.605	+ 12.8575	+ 82	35	20.62	6.241
δ Geminorum	3.5	7	14	41.392	3.5869	+ 22	9	1.97	6.432
Piazzi vii, 67	5.7	7	21	25.298	6.2801	+ 68	39	9.31	7.018
β Canis Minoris	3.1	7	22	13.005	3.2557	+ 8	28	23.74	7.085
α^2 Geminorum (*Castor*)	1.9	7	28	47.735	+ 3.8340	+ 32	5	20.48	− 7.656
† α Canis Min. (*Procyon*)	0.5	7	34	32.338	3.1424	+ 5	27	31.09	9.074
β Geminorum (*Pollux*)	1.2	7	39	44.961	3.6765	+ 28	14	47.84	8.507
φ Geminorum	5.0	7	47	55.820	3.6774	+ 27	0	7.27	9.122
26 Lyncis	5.8	7	48	5.477	4.3833	+ 47	48	4.47	9.113
Groombridge 1374	5.6	7	49	19.307	+ 7.2553	+ 74	9	43.72	− 9.240
ω^1 Cancri	6.0	7	55	25.602	3.6347	+ 25	38	33.02	9.679
15 Argûs (ρ)	3.1	8	3	40.100	2.5546	− 24	2	29.11	10.247
3 Ursæ Majoris (H.)	5.5	8	3	46.127	6.0192	+ 68	44	34.52	10.302
ζ^1 Cancri	4.8	8	6	59.684	3.4451	+ 17	55	22.29	10.677
β Cancri	3.8	8	11	34.869	+ 3.2561	+ 9	27	59.57	− 10.939
30 Monocerotis	3.9	8	21	6.870	+ 2.9998	− 3	36	32.53	11.597
θ Chamæleontis	4.6	8	23	23.072	− 1.7372	− 77	11	28.51	11.722
η Cancri	5.4	8	27	26.912	+ 3.4752	+ 20	45	2.90	12.081
σ Hydræ	4.5	8	34	0.137	3.1386	+ 3	39	41.25	12.492
γ Cancri	4.9	8	38	1.337	+ 3.4777	+ 21	47	46.66	− 12.795
ε Hydræ	3.5	8	41	57.501	3.1802	+ 6	45	11.58	13.065
σ^2 Cancri (*mean*)	5.5	8	48	41.743	3.6693	+ 30	55	28.46	13.480
ι Ursæ Majoris	3.3	8	52	58.970	4.1254	+ 48	23	58.24	13.983
σ^2 Ursæ Majoris	5.0	9	2	24.044	5.3301	+ 67	30	16.81	14.389
κ Cancri	5.1	9	2	49.201	+ 3.2533	+ 11	2	5.47	− 14.361
θ Hydræ	4.0	9	9	37.870	3.1240	+ 2	41	55.21	15.070
β Argûs	2.0	9	12	12.299	+ 0.6721	− 69	20	32.29	− 14.816

† Periodic corrections given in the Appendix are still to be applied to the positions of Sirius and Procyon.

MEAN PLACES FOR 1909.0. (January 0^d.279, Washington.)

Name of Star.	Magnitude.	Right Ascension.	Annual Variation.	Declination.	Annual Variation.
		h m s	s	° ′ ″	″
ι Argûs	2.6	9 14 39.158	+ 1.6042	− 58 53 35.16	− 15.045
α Lyncis	3.3	9 15 30.892	3.6651	+ 34 46 40.22	15.089
α Hydræ	2.1	9 23 6.961	2.9487	− 8 15 49.38	15.497
1 Draconis (H.)	4.5	9 24 11.190	8.8468	+ 81 43 46.69	15.616
d Ursæ Majoris	4.8	9 26 27.269	5.3702	+ 70 13 51.34	15.642
θ Ursæ Majoris	3.2	9 26 46.663	+ 4.0337	+ 52 5 33.40	− 16.274
10 Leonis Minoris	4.7	9 28 39.166	3.6869	+ 36 48 7.48	15.853
ο Leonis	3.8	9 36 17.728	+ 3.2055	+ 10 18 24.46	16.266
ζ Chamæleontis	5.2	9 36 35.510	− 1.6332	− 80 31 57.04	16.229
ε Leonis	3.2	9 40 41.302	+ 3.4120	+ 24 11 36.93	16.477
μ Leonis	4.0	9 47 35.415	+ 3.4183	+ 26 26 9.37	− 16.847
19 Leonis Minoris	5.2	9 52 6.912	3.6872	+ 41 29 21.95	17.028
π Leonis	5.0	9 55 24.341	3.1727	+ 8 28 52.23	17.183
α Leonis (*Regulus*)	1.3	10 3 31.634	3.1988	+ 12 24 44.18	17.514
32 Ursæ Majoris	5.7	10 11 26.273	4.4001	+ 65 33 45.75	17.851
λ Ursæ Majoris	3.6	10 11 36.842	+ 3.6333	+ 43 22 9.11	− 17.884
γ^1 Leonis	2.5	10 14 57.443	3.3125	+ 20 18 7.80	18.129
μ Hydræ	4.1	10 21 41.333	2.9003	− 16 22 17.14	18.309
β Leonis Minoris	4.3	10 22 37.540	3.4809	+ 37 10 25.49	18.376
α Antliæ	4.5	10 22 59.177	2.7418	− 30 36 16.10	18.300
9 Draconis (H.)	5.0	10 27 23.230	+ 5.2007	+ 76 10 55.66	− 18.441
ρ Leonis	4.0	10 28 1.265	3.1621	+ 9 46 30.64	18.457
41 Leonis Minoris	5.1	10 38 28.236	3.2681	+ 23 39 54.22	18.782
η Argûs (*var.*)	1–6	10 41 31.671	2.3195	− 59 12 21.41	18.892
l Leonis	5.3	10 44 28.533	3.1569	+ 11 1 36.71	19.000
δ^2 Chamæleontis	4.7	10 44 56.247	+ 0.6001	− 80 3 36.76	− 18.984
46 Leonis Minoris	3.9	10 48 13.561	3.3650	+ 34 42 20.58	19.354
Groombridge 1706	6.3	10 52 42.089	4.9069	+ 78 15 28.39	19.223
α Ursæ Majoris	2.0	10 58 7.291	+ 3.7334	+ 62 14 32.87	19.391
η Octantis	6.1	10 59 58.08*	− 0.3358	− 84 6 15.67	19.367
p^3 Leonis	6.2	11 2 15.755	+ 3.0614	+ 2 26 59.24	− 19.493
ψ Ursæ Majoris	3.2	11 4 33.151	3.3873	+ 44 59 32.80	19.495
δ Leonis	2.7	11 9 16.260	3.1960	+ 21 1 20.62	19.698
ν Ursæ Majoris	3.7	11 13 34.010	3.2493	+ 33 35 27.65	19.610
δ Crateris	3.9	11 14 47.397	2.9970	− 14 17 9.47	19.462
τ Leonis	5.1	11 23 15.470	+ 3.0859	+ 3 21 27.14	− 19.806
λ Draconis	4.0	11 26 0.841	3.6029	+ 69 50 0.35	19.847
ξ Hydræ	3.8	11 28 31.437	2.9452	− 31 21 14.71	19.912
υ Leonis	4.4	11 32 17.369	3.0715	− 0 19 16.44	19.861
χ Ursæ Majoris	3.9	11 41 15.003	3.1822	+ 48 17 2.42	19.959
β Leonis	2.2	11 44 25.152	+ 3.0628	+ 15 4 50.88	− 20.118
γ Ursæ Majoris	2.4	11 49 2.986	3.1725	+ 54 12 2.63	20.019
π Virginis	4.6	11 56 12.586	3.0744	+ 7 7 18.32	20.075
ο Virginis	4.3	12 0 34.451	3.0572	+ 9 14 18.05	20.014
ε Corvi	3.2	12 5 26.559	3.0803	− 22 6 49.29	20.038
4 Draconis (H.)	5.1	12 7 56.850	+ 2.8548	+ 78 7 18.82	− 20.015
γ Corvi	2.7	12 11 7.453	3.0810	− 17 2 11.80	20.006
2 Canum Venaticorum	6.0	12 11 34.224	+ 3.0174	+ 41 9 59.79	− 20.066

MEAN PLACES FOR 1909.0. (January $0^d.279$, Washington.)

Name of Star.	Magnitude.	Right Ascension.	Annual Variation.	Declination.	Annual Variation.
		h m s	s	° ′ ″	″
β Chamæleontis	4.5	12 12 59.274	+3.4363	−78 48 24.97	−19.997
6 Ursæ Minoris (B.)	6.2	12 14 25.650	0.3175	+88 12 15.66	19.948
η Virginis	4.0	12 15 15.013	3.0692	− 0 9 40.09	20.029
α^1 Crucis	0.9	12 21 31.696	3.3079	−62 35 41.47	19.997
δ^2 Corvi	3.1	12 25 9.257	3.1005	−16 0 31.91	20.074
β Canum Venaticorum	4.4	12 29 25.484	+2.8575	+41 51 6.61	−19.602
β Corvi	2.8	12 29 36.244	3.1444	−22 53 36.90	19.940
κ Draconis	3.8	12 29 36.295	2.5808	+70 17 23.19	19.869
γ Virginis (*mean*)	2.9	12 37 2.972	3.0395	− 0 57 1.40	19.781
31 Comæ Berenices	5.1	12 47 16.014	2.9245	+28 2 8.65	19.645
32^2 Camelopardalis (H.)	5.2	12 48 26.939	+0.4268	+83 54 27.13	−19.584
α Canum Venaticorum	3.2	12 51 46.369	2.8115	+38 48 34.86	19.488
δ Muscæ	3.8	12 55 59.698	4.0640	−71 3 29.36	19.482
ε Virginis	3.1	12 57 38.822	2.9865	+11 26 53.13	19.401
θ Virginis	4.6	13 5 14.211	3.1028	− 5 3 12.07	19.279
20 Canum Venaticorum	4.7	13 13 27.881	+2.6964	+41 3 5.65	−19.010
α Virginis (*Spica*)	1.1	13 20 23.835	3.1563	−10 41 11.39	18.858
κ Octantis	5.4	13 26 2.23*	8.9825	−85 19 12.99	18.673
ζ Virginis	3.6	13 30 3.300	3.0541	− 0 7 50.99	18.479
B. A. C. 4536	5.0	13 30 44.117	2.6823	+37 38 54.49	18.499
m Virginis	5.4	13 36 50.041	+3.1446	− 8 14 38.62	−18.251
η Ursæ Majoris	1.9	13 43 57.396	2.3685	+49 46 1.85	18.042
η Bootis	2.8	13 50 21.114	2.8568	+18 51 12.95	18.130
θ Apodis (*var.*)	5.0	13 56 25.828	5.7219	−76 21 28.60	17.543
β Centauri	0.7	13 57 23.600	4.2007	−59 56 3.57	17.506
π Hydræ	3.6	14 1 11.172	+3.4080	−26 14 39.62	−17.454
α Draconis	3.7	14 1 55.559	1.6241	+64 48 38.09	17.264
d Bootis	4.8	14 6 14.967	2.7371	+25 31 20.50	17.158
κ Virginis	4.2	14 8 2.383	+3.1961	− 9 51 1.74	16.866
4 Ursæ Minoris	4.9	14 9 11.328	−0.2905	+77 58 30.23	16.919
α Bootis (*Arcturus*)	0.2	14 11 30.617	+2.7354	+19 39 21.03	−18.838
δ Octantis	5.0	14 12 13.992	9.1827	−83 15 6.74	16.815
λ Bootis	4.3	14 12 55.540	2.2834	+46 30 21.14	16.617
λ Virginis	4.7	14 14 10.988	3.2399	−12 57 9.30	16.687
θ Bootis	4.1	14 22 5.983	+2.0434	+52 16 15.90	16.720
5 Ursæ Minoris	4.5	14 27 42.300	−0.1697	+76 6 2.17	−16.004
ρ Bootis	3.6	14 27 54.516	+2.5866	+30 46 13.86	15.901
α^2 Centauri	0.2	14 33 24.627	4.0503	−60 27 36.86	14.995
33 Bootis	5.3	14 35 27.095	2.2343	+44 47 48.68	15.652
α Apodis	4.1	14 36 30.679	7.2686	−78 39 33.09	15.574
ε Bootis	2.6	14 41 0.772	+2.6203	+27 27 26.81	−15.290
α^2 Libræ	2.9	14 45 50.500	+3.3128	−15 39 50.51	15.099
β Ursæ Minoris	2.2	14 50 57.713	−0.2106	+74 31 38.58	14.720
β Bootis	3.7	14 58 31.102	+2.2600	+40 44 56.82	14.306
γ Scorpii	3.4	14 58 44.477	3.5036	−24 55 28.91	14.300
δ Bootis	3.5	15 11 50.052	+2.4192	+33 39 13.90	−13.549
β Libræ	2.9	15 12 6.496	+3.2241	− 9 2 51.40	13.430
γ^2 Ursæ Minoris	3.2	15 20 51.997	−0.1201	+72 9 28.01	−12.814

MEAN PLACES FOR 1909.0. (January 0^d.279, Washington.)

Name of Star.	Magnitude.	Right Ascension.	Annual Variation.	Declination.	Annual Variation.
		h m s	s	° ′ ″	″
μ^1 Bootis . . .	4.5	15 21 3.165	+ 2.2663	+ 37 41 45.29	− 12.733
ρ Octantis . . .	5.7	15 22 10.13*	13.2513	− 84 9 49.59	12.660
β Coronæ Borealis. .	3.9	15 24 4.632	2.4737	+ 29 25 8.26	12.532
α Coronæ Borealis. .	2.3	15 30 50.077	2.5393	+ 27 1 13.67	12.245
α Serpentis . . .	2.7	15 39 47.079	2.9527	+ 6 42 41.15	11.471
ε Serpentis . . .	3.7	15 46 16.719	+ 2.9879	+ 4 45 4.53	− 10.974
ζ Ursæ Minoris . .	4.6	15 47 17.352	− 2.2156	+ 78 4 29.24	10.974
ε Coronæ Borealis. .	4.1	15 53 49.151	+ 2.4821	+ 27 8 27.24	10.555
δ Scorpii . . .	2.6	15 54 56.996	3.5413	− 22 21 47.83	10.438
β^1 Scorpii . . .	2.9	16 0 8.574	3.4827	− 19 33 24.82	10.040
φ Herculis . . .	4.2	16 5 54.147	+ 1.8895	+ 45 10 23.33	− 9.536
Groombridge 2320 .	5.5	16 6 4.255	0.1504	+ 68 2 59.05	9.508
δ^1 Apodis . . .	4.9	16 6 42.947	8.8333	− 78 28 4.26	9.566
δ Ophiuchi . . .	2.8	16 9 34.526	3.1410	− 3 27 37.88	9.433
σ Coronæ Borealis. .	5.3	16 11 16.222	2.2456	+ 34 5 20.13	9.229
τ Herculis . . .	3.9	16 17 0.331	+ 1.8028	+ 46 31 46.81	− 8.679
γ Apodis . . .	4.0	16 19 27.856	+ 9.0833	− 78 41 39.04	8.596
η Ursæ Minoris . .	5.0	16 20 9.083	− 1.7973	+ 75 57 55.28	8.207
η Draconis . . .	2.8	16 22 45.430	+ 0.8068	+ 61 43 11.98	8.195
α Scorpii (*Antares*) .	1.2	16 23 49.532	3.6732	− 26 13 50.35	8.196
β Herculis . . .	2.8	16 26 18.412	+ 2.5772	+ 21 41 14.34	− 7.993
A Draconis . . .	5.0	16 28 9.369	− 0.1321	+ 68 57 54.12	7.784
ζ Ophiuchi . . .	2.8	16 32 8.789	+ 3.3003	− 10 23 0.01	7.475
α Trianguli Australis .	2.2	16 39 1.181	6.3183	− 68 51 41.86	6.986
η Herculis . . .	3.7	16 39 46.538	2.0555	+ 39 5 41.42	6.968
κ Ophiuchi . . .	3.4	16 53 21.610	+ 2.8379	+ 9 30 57.34	− 5.758
ε Ursæ Minoris . .	4.5	16 55 15.601	− 6.2769	+ 82 11 17.74	5.588
d Herculis . . .	5.3	16 58 14.720	+ 2.2119	+ 33 41 58.15	5.345
η Ophiuchi . . .	2.5	17 5 9.452	3.4370	− 15 36 46.12	4.660
α^1 Herculis (*var.*) . .	3.2	17 10 29.855	2.7343	+ 14 29 36.47	4.267
π Herculis . . .	3.4	17 11 52.609	+ 2.0882	+ 36 54 40.48	− 4.179
θ Ophiuchi . . .	3.3	17 16 25.168	3.6813	− 24 54 33.71	3.825
b Ophiuchi (*var.*) . .	4.4	17 20 48.662	3.6604	− 24 5 32.46	3.549
δ Aræ . . .	3.8	17 22 52.795	5.4043	− 60 36 32.48	3.353
β Draconis . . .	3.0	17 28 22.559	1.3539	+ 52 22 6.38	2.748
α Ophiuchi . . .	2.2	17 30 42.588	+ 2.7836	+ 12 37 32.33	− 2.790
ι Herculis . . .	4.0	17 36 53.779	+ 1.6933	+ 46 3 15.85	2.014
ω Draconis . . .	4.9	17 37 28.975	− 0.3548	+ 68 48 0.22	1.648
μ Herculis . . .	3.5	17 42 53.797	+ 2.3468	+ 27 46 24.26	2.243
ψ^1 Draconis . . .	4.8	17 43 33.255	− 1.0754	+ 72 11 37.38	1.705
θ Herculis . . .	3.9	17 53 7.921	+ 2.0569	+ 37 15 43.59	− 0.596
γ Draconis . . .	2.5	17 54 29.578	1.3923	+ 51 29 57.34	0.506
γ^2 Sagittarii . . .	2.9	17 59 57.667	+ 3.8518	− 30 25 33.13	− 0.201
δ Ursæ Minoris . .	4.4	18 1 37.29*	− 19.4964	+ 86 36 50.56	+ 0.189
ο Herculis . . .	3.9	18 3 59.544	+ 2.3393	+ 28 44 58.03	0.351
μ Sagittarii . . .	4.1	18 8 19.247	+ 3.5869	− 21 4 59.82	+ 0.726
η Serpentis . . .	3.5	18 16 36.025	3.1027	− 2 55 22.67	0.759
λ Sagittarii . . .	2.9	18 22 21.290	+ 3.7028	− 25 28 21.84	+ 1.753

MEAN PLACES FOR 1909.0. (January $0^{d}.279$, Washington.)

Name of Star.	Magnitude.	Right Ascension.			Annual Variation.	Declination.			Annual Variation.
		h	m	s	s	°	′	″	″
χ Draconis	3.8	18	22	41.979	− 1.0780	+72	41	36.58	+ 1.609
ι Aquilæ	4.0	18	30	15.303	+ 3.2646	−8	18	29.79	2.323
ζ Pavonis	4.2	18	32	24.268	7.0227	−71	30	25.81	2.661
α Lyræ (*Vega*)	0.2	18	33	51.444	2.0313	+38	41	54.67	3.231
β Lyræ (*var.*)	3.6	18	46	43.201	+ 2.2146	+33	15	23.58	4.053
50 Draconis	5.6	18	49	18.935	− 1.9167	+75	19	36.54	+ 4.331
σ Sagittarii	2.3	18	49	37.353	+ 3.7204	−26	24	37.68	4.232
γ Lyræ	3.3	18	55	32.350	2.2434	+32	33	51.20	4.805
ζ Aquilæ	3.1	19	1	13.643	2.7569	+13	43	39.46	5.193
ι Lyræ	5.2	19	4	3.290	+ 2.1412	+35	57	24.97	5.524
λ Ursæ Minoris	6.5	19	12	8.55*	−70.1533	+89	0	15.62	+ 6.214
d Sagittarii	5.0	19	12	18.670	+ 3.5113	−19	6	55.66	6.204
δ Draconis	3.1	19	12	32.232	0.0237	+67	30	5.23	6.327
θ Lyræ	4.4	19	13	12.541	2.0808	+37	58	16.69	6.301
σ Octantis	5.6	19	14	48.40*	+98.6174	−89	14	24.26	6.426
τ Draconis	4.5	19	17	18.612	− 1.1321	+73	11	12.46	+ 6.744
δ Aquilæ	3.5	19	20	54.619	+ 3.0250	+2	55	57.98	7.012
β Cygni	3.1	19	27	3.075	2.4188	+27	46	4.92	7.422
κ Aquilæ	5.0	19	31	59.807	3.2291	−7	13	48.95	7.834
β Sagittæ	4.5	19	36	57.692	2.6939	+17	15	52.97	8.198
γ Aquilæ	2.8	19	41	56.002	+ 2.8520	+10	23	27.39	+ 8.622
δ Cygni	2.9	19	42	7.889	1.8760	+44	54	29.68	8.685
α Aquilæ (*Altair*)	0.9	19	46	20.607	+ 2.9272	+8	37	38.67	9.350
ε Draconis	3.9	19	48	29.244	− 0.1850	+70	2	10.08	9.166
ε Pavonis	4.1	19	50	4.783	+ 6.9972	−73	9	5.09	9.142
β Aquilæ	3.9	19	50	50.600	+ 2.9469	+6	10	44.23	+ 8.841
γ Sagittæ	3.6	19	54	42.592	2.6673	+19	14	40.18	9.645
c Sagittarii	4.5	19	57	3.861	3.6938	−27	57	48.30	9.813
τ Aquilæ	5.7	19	59	41.689	2.9309	+7	1	15.02	10.029
θ Aquilæ	3.3	20	6	36.603	3.0962	−1	5	30.80	10.525
31 Cygni	3.9	20	10	46.011	+ 1.8901	+46	27	53.98	+ 10.832
κ Cephei (*pr.*)	4.4	20	11	58.226	− 1.9552	+77	26	15.73	10.941
α^2 Capricorni	3.7	20	13	0.401	+ 3.3309	−12	49	38.67	10.999
α Pavonis	2.1	20	18	27.214	4.7679	−57	1	38.41	11.295
γ Cygni	2.3	20	18	57.727	2.1525	+39	57	54.00	11.424
π Capricorni	5.1	20	22	6.822	+ 3.4370	−18	30	37.59	+ 11.646
ε Delphini	4.0	20	28	51.946	+ 2.8665	+10	59	36.50	12.099
Groombridge 3241	6.5	20	30	24.421	− 0.2346	+72	13	24.30	12.213
α Delphini	3.9	20	35	24.693	+ 2.7868	+15	35	26.77	12.592
β Pavonis	3.4	20	36	46.117	5.4502	−66	31	51.41	12.664
α Cygni	1.4	20	38	19.761	+ 2.0446	+44	57	17.16	+ 12.771
ψ Capricorni	4.3	20	40	42.595	3.5576	−25	35	53.59	12.785
ε Cygni	2.6	20	42	31.750	2.4273	+33	37	44.35	13.380
μ Aquarii	4.8	20	47	44.803	+ 3.2382	−9	19	31.16	13.358
12 Year Catalogue 1879	5.3	20	51	44.696	− 2.6091	+80	12	41.39	13.630
ν Cygni	4.1	20	53	46.805	+ 2.2353	+40	48	58.96	+ 13.767
61^1 Cygni	5.4	21	2	48.984	2.6850	+38	18	5.28	17.594
ζ Cygni	3.3	21	9	3.760	+ 2.5518	+29	51	11.65	+ 14.663

MEAN PLACES FOR 1909.0. (January $0^d.279$, Washingon.)

Name of Star.	Magnitude.	Right Ascension.			Annual Variation.	Declination.			Annual Variation.
		h	m	s	s	°	′	″	″
τ Cygni	3.8	21	11	9.485	+ 2.3937	+ 37	39	23.79	+ 15.281
α Cephei	2.6	21	16	24.542	1.4353	+ 62	11	59.27	15.202
1 Pegasi	4.3	21	17	52.672	2.7739	+ 19	24	53.22	15.300
ζ Capricorni	3.8	21	21	28.448	3.4313	− 22	48	21.17	15.459
β Aquarii	2.9	21	26	46.162	3.1603	− 5	58	18.96	15.719
β Cephei (*pr.*)	3.4	21	27	29.438	+ 0.7881	+ 70	9	40.00	+ 15.775
ξ Aquarii	4.8	21	32	54.523	3.1962	− 8	15	45.64	16.034
74 Cygni	5.0	21	33	18.065	2.4029	+ 40	0	15.75	16.087
λ^1 Octantis	5.4	21	37	3.098	9.5980	− 83	8	17.32	16.259
ε Pegasi	2.4	21	39	42.984	2.9462	+ 9	27	26.66	16.406
11 Cephei	4.8	21	40	35.505	+ 0.8901	+ 70	53	32.13	+ 16.543
π^2 Cygni	4.5	21	43	25.824	2.2140	+ 48	53	17.66	16.590
μ Capricorni	5.2	21	48	20.155	3.2737	− 13	58	50.13	16.829
16 Pegasi	5.1	21	48	55.256	2.7281	+ 25	29	48.25	16.862
79 Draconis	6.6	21	51	43.489	0.7217	+ 73	16	17.95	17.003
α Aquarii	3.0	22	1	6.638	+ 3.0823	− 0	45	43.94	+ 17.407
α Gruis	1.9	22	2	30.119	3.7964	− 47	24	7.87	17.294
π^2 Pegasi	4.3	22	5	56.696	2.6621	+ 32	43	53.03	17.596
θ Aquarii	4.4	22	12	1.956	3.1677	− 8	14	11.95	17.844
υ Octantis	6.2	22	14	29.22*	12.5523	− 86	25	51.66	18.033
γ Aquarii	4.0	22	16	57.392	+ 3.0993	− 1	50	45.83	+ 18.069
π Aquarii	4.6	22	20	37.780	3.0639	+ 0	54	55.12	18.190
σ Aquarii	4.9	22	25	49.972	3.1776	− 11	8	37.74	18.352
α Lacertæ	3.9	22	27	32.458	2.4670	+ 49	48	51.79	18.450
226 Cephei (B.)	5.7	22	30	40.708	1.0669	+ 75	45	26.65	18.543
η Aquarii	4.2	22	30	40.838	+ 3.0834	− 0	35	12.27	+ 18.490
10 Lacertæ	5.0	22	35	10.594	2.6881	+ 38	34	34.98	18.677
β Octantis	4.4	22	36	48.337	6.3593	− 81	51	32.38	18.742
ζ Pegasi	3.5	22	36	55.395	2.9913	+ 10	21	21.79	18.730
λ Pegasi	4.1	22	42	8.788	2.8864	+ 23	5	11.60	18.892
ι Cephei	3.6	22	46	26.288	+ 2.1267	+ 65	43	17.78	+ 18.896
λ Aquarii	3.8	22	47	52.064	3.1313	− 8	3	50.52	19.097
α Pis. Austr. (*Fomalhaut*)	1.3	22	52	37.478	3.3222	− 30	6	17.14	19.015
ο Andromedæ	3.8	22	57	43.882	2.7534	+ 41	50	12.26	19.301
α Pegasi (*Markab*)	2.5	23	0	13.613	2.9860	+ 14	42	55.75	19.329
φ Aquarii	4.3	23	9	36.592	+ 3.1074	− 6	32	23.04	+ 19.369
υ Cephei	5.1	23	14	53.063	2.4492	+ 67	36	48.63	19.677
τ Pegasi	4.6	23	16	7.861	2.9651	+ 23	14	31.49	19.668
θ Piscium	4.3	23	23	21.082	3.0418	+ 5	52	44.73	19.750
λ Andromedæ	3.8	23	33	6.408	2.9265	+ 45	57	54.30	19.488
ι Piscium	4.3	23	35	16.150	+ 3.0842	+ 5	7	58.81	+ 19.493
γ Cephei	3.5	23	35	36.361	2.4342	+ 77	7	28.10	20.090
ι^2 Aquarii	5.2	23	39	28.979	3.1150	− 18	46	55.61	19.960
δ Sculptoris	4.6	23	44	11.216	3.1287	− 28	38	1.81	19.865
γ^1 Octantis	5.2	23	46	47.448	3.6344	− 82	31	28.44	20.001
Groombridge 4163	6.6	23	50	23.440	+ 2.8744	+ 73	54	14.03	+ 20.024
ω Piscium	4.2	23	54	38.262	+ 3.0792	+ 6	21	34.46	+ 19.933

(CONSTANTS OF STRUVE AND PETERS.)

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Ursæ Min. (*Polaris*).		Mean Solar Date.	51 Cephei (Hev.).		Mean Solar Date.	6 Ursæ Min. (B.).		Mean Solar Date.	δ Ursæ Min.		Mean Solar Date.	λ Ursæ Min.	
	Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Jan.	1 25	+88 49	Jan.	6 58	+87 11	Jan.	12 14	+88 12	Jan.	18 1	+86 36	Jan.	19 11	+89 0
	s	″		s	″		s	″		s	″		s	″
0.3	92.64	28.7	0.5	27.72	36.7	0.7	30.85	2.0	0.9	21.07	46.7	1.0	13.96	16.1
1.3	91.72	28.8	1.5	27.84	37.0	1.7	31.51	2.0	1.9	21.08	46.4	2.0	13.60	15.8
2.3	90.85	29.0	2.5	27.96	37.3	2.7	32.16	2.0	2.9	21.08	46.1	3.0	13.20	15.5
3.3	89.96	29.1	3.5	28.08	37.6	3.7	32.84	2.0	3.9	21.07	45.8	4.0	12.77	15.2
4.3	89.02	29.2	4.5	28.22	37.9	4.7	33.54	1.9	4.9	21.06	45.4	5.0	12.33	14.9
5.3	88.03	29.4	5.5	28.37	38.2	5.7	34.27	1.9	5.9	21.07	45.1	6.0	11.90	14.6
6.3	86.98	29.5	6.5	28.51	38.6	6.7	35.05	1.8	6.9	21.08	44.7	6.9	11.51	14.2
7.3	85.87	29.6	7.5	28.62	38.9	7.7	35.85	1.8	7.9	21.12	44.3	7.9	11.18	13.9
8.3	84.71	29.7	8.5	28.70	39.3	8.7	36.66	1.8	8.9	21.18	43.9	8.9	10.93	13.5
9.3	83.52	29.8	9.5	28.76	39.7	9.7	37.47	1.8	9.9	21.28	43.5	9.9	10.78	13.1
10.3	82.34	29.9	10.5	28.79	40.0	10.7	38.25	1.9	10.9	21.40	43.2	10.9	10.71	12.7
11.3	81.17	29.9	11.5	28.78	40.4	11.7	39.00	2.0	11.9	21.52	42.8	11.9	10.70	12.4
12.2	80.05	29.9	12.5	28.76	40.7	12.7	39.70	2.0	12.9	21.65	42.5	12.9	10.74	12.0
13.2	78.99	29.9	13.5	28.74	41.0	13.7	40.37	2.1	13.9	21.77	42.2	13.9	10.78	11.7
14.2	77.99	29.9	14.5	28.72	41.3	14.7	41.01	2.2	14.9	21.89	41.9	14.9	10.81	11.4
15.2	77.02	30.0	15.5	28.71	41.6	15.7	41.64	2.2	15.9	21.99	41.6	15.9	10.80	11.1
16.2	76.07	30.0	16.5	28.71	41.9	16.7	42.27	2.3	16.9	22.09	41.3	16.9	10.75	10.8
17.2	75.11	30.0	17.5	28.72	42.2	17.7	42.91	2.3	17.9	22.18	41.0	17.9	10.65	10.5
18.2	74.12	30.1	18.5	28.75	42.5	18.7	43.59	2.4	18.9	22.27	40.7	18.9	10.55	10.2
19.2	73.08	30.1	19.5	28.78	42.8	19.7	44.30	2.4	19.9	22.35	40.4	19.9	10.45	9.8
20.2	71.99	30.2	20.4	28.79	43.2	20.7	45.04	2.5	20.9	22.46	40.0	20.9	10.39	9.5
21.2	70.85	30.2	21.4	28.78	43.5	21.7	45.80	2.6	21.9	22.59	39.6	21.9	10.39	9.1
22.2	69.68	30.2	22.4	28.76	43.9	22.7	46.56	2.7	22.9	22.75	39.3	22.9	10.47	8.8
23.2	68.49	30.2	23.4	28.70	44.3	23.7	47.30	2.8	23.9	22.93	38.9	23.9	10.64	8.4
24.2	67.31	30.2	24.4	28.60	44.6	24.7	48.03	3.0	24.9	23.13	38.6	24.9	10.90	8.0
25.2	66.17	30.2	25.4	28.49	45.0	25.7	48.71	3.2	25.9	23.34	38.3	25.9	11.21	7.7
26.2	65.09	30.1	26.4	28.36	45.3	26.7	49.34	3.3	26.9	23.55	38.0	26.9	11.56	7.4
27.2	64.06	30.0	27.4	28.22	45.6	27.7	49.93	3.5	27.9	23.76	37.8	27.9	11.91	7.0
28.2	63.08	29.9	28.4	28.08	45.9	28.7	50.48	3.6	28.9	23.95	37.5	28.9	12.25	6.7
29.2	62.15	29.9	29.4	27.96	46.1	29.7	51.03	3.8	29.9	24.14	37.3	29.9	12.56	6.5
30.2	61.24	29.8	30.4	27.86	46.4	30.7	51.59	3.9	30.9	24.32	37.0	30.9	12.83	6.2
31.2	60.31	29.8	31.4	27.77	46.7	31.6	52.17	4.0	31.9	24.50	36.8	31.9	13.08	5.9
32.2	59.34	29.7	32.4	27.66	47.0	32.6	52.76	4.2	32.9	24.68	36.5	32.9	13.32	5.6

(CONSTANTS OF STRUVE AND PETERS.)

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Ursæ Min. (*Polaris*).		Mean Solar Date.	51 Cephei (Hev.).		Mean Solar Date.	6 Ursæ Min. (B.).		Mean Solar Date.	δ Ursæ Min.		Mean Solar Date.	λ Ursæ Min.	
	Right Ascension.	Declination *North*.		Right Ascension.	Declination *North*.		Right Ascension.	Declination *North*.		Right Ascension.	Declination *North*.		Right Ascension.	Declination *North*.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Feb.	1 25	+88 49	Feb.	6 58	+87 11	Feb.	12 14	+88 12	Feb.	18 1	+86 36	Feb.	19 11	+88 59
	s	″		s	″		s	″		s	″		s	″
1.2	59.34	29.7	1.4	27.66	47.0	1.6	52.76	4.2	1.9	24.68	36.5	1.9	13.32	65.6
2.2	58.33	29.7	2.4	27.56	47.3	2.6	53.40	4.3	2.9	24.87	36.2	2.9	13.59	65.3
3.2	57.25	29.6	3.4	27.43	47.6	3.6	54.07	4.5	3.9	25.08	35.9	3.9	13.92	64.9
4.2	56.14	29.6	4.4	27.29	47.9	4.6	54.74	4.6	4.9	25.31	35.6	4.9	14.31	64.6
5.2	55.00	29.5	5.4	27.12	48.2	5.6	55.40	4.8	5.9	25.57	35.3	5.9	14.79	64.2
6.2	53.86	29.4	6.4	26.92	48.6	6.6	56.04	5.0	6.9	25.86	35.0	6.9	15.36	63.9
7.2	52.76	29.2	7.4	26.69	48.9	7.6	56.64	5.2	7.9	26.16	34.7	7.9	16.01	63.6
8.2	51.69	29.1	8.4	26.44	49.2	8.6	57.19	5.5	8.9	26.46	34.5	8.9	16.70	63.3
9.2	50.67	28.9	9.4	26.17	49.5	9.6	57.71	5.7	9.9	26.77	34.3	9.9	17.41	63.0
10.2	49.73	28.7	10.4	25.91	49.7	10.6	58.19	5.9	10.9	27.07	34.1	10.9	18.11	62.7
11.2	48.85	28.6	11.4	25.67	50.0	11.6	58.63	6.1	11.9	27.34	33.9	11.9	18.77	62.5
12.2	48.02	28.4	12.4	25.43	50.2	12.6	59.06	6.3	12.9	27.60	33.7	12.9	19.40	62.2
13.2	47.21	28.3	13.4	25.20	50.4	13.6	59.49	6.5	13.8	27.85	33.5	13.9	19.97	62.0
14.2	46.38	28.2	14.4	25.00	50.7	14.6	59.95	6.7	14.8	28.09	33.3	14.9	20.49	61.7
15.2	45.52	28.0	15.4	24.80	50.9	15.6	60.43	6.9	15.8	28.34	33.1	15.9	21.02	61.4
16.2	44.62	27.9	16.4	24.60	51.2	16.6	60.94	7.1	16.8	28.59	32.8	16.9	21.58	61.2
17.2	43.67	27.8	17.4	24.38	51.5	17.6	61.47	7.4	17.8	28.87	32.6	17.9	22.18	60.9
18.2	42.68	27.6	18.4	24.13	51.7	18.6	62.00	7.6	18.8	29.16	32.3	18.9	22.86	60.6
19.1	41.68	27.5	19.4	23.86	52.0	19.6	62.53	7.9	19.8	29.48	32.1	19.9	23.61	60.3
20.1	40.71	27.3	20.4	23.57	52.3	20.6	63.03	8.2	20.8	29.82	31.9	20.9	24.44	60.0
21.1	39.77	27.1	21.4	23.26	52.6	21.6	63.48	8.5	21.8	30.16	31.7	21.9	25.33	59.7
22.1	38.89	26.9	22.4	22.92	52.8	22.6	63.87	8.8	22.8	30.51	31.6	22.9	26.26	59.4
23.1	38.07	26.6	23.4	22.57	53.0	23.6	64.22	9.1	23.8	30.86	31.4	23.9	27.20	59.2
24.1	37.33	26.4	24.4	22.23	53.2	24.6	64.53	9.4	24.8	31.19	31.3	24.9	28.13	59.0
25.1	36.64	26.2	25.4	21.90	53.4	25.6	64.81	9.6	25.8	31.52	31.2	25.9	29.02	58.8
26.1	35.99	26.0	26.4	21.58	53.6	26.6	65.08	9.9	26.8	31.83	31.1	26.9	29.87	58.6
27.1	35.34	25.8	27.4	21.29	53.8	27.6	65.37	10.2	27.8	32.12	30.9	27.9	30.68	58.4
28.1	34.66	25.6	28.4	21.00	53.9	28.6	65.68	10.4	28.8	32.41	30.8	28.9	31.47	58.2
29.1	33.96	25.4	29.3	20.70	54.1	29.6	66.03	10.6	29.8	32.71	30.7	29.9	32.27	58.0
30.1	33.21	25.2	30.3	20.41	54.3	30.6	66.39	10.9	30.8	33.03	30.5	30.9	33.11	57.8

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Ursæ Min. (*Polaris*).		Mean Solar Date.	51 Cephei (Hev.).		Mean Solar Date.	6 Ursæ Min. (B.).		Mean Solar Date.	δ Ursæ Min.		Mean Solar Date.	λ Ursæ Min.	
	Right Ascension.	Declination *North*.		Right Ascension.	Declination *North*.		Right Ascension.	Declination *North*.		Right Ascension.	Declination *North*.		Right Ascension.	Declination *North*.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Mar.	1 25	+88 49	Mar.	6 58	+87 11	Mar.	12 15	+88 12	Mar.	18 1	+86 36	Mar.	19 11	+88 59
	s	″		s	″		s	″		s	″		s	″
1.1	33.96	25.4	1.3	20.70	54.1	1.6	6.03	10.6	1.8	32.71	30.7	1.9	32.27	58.0
2.1	33.21	25.2	2.3	20.41	54.3	2.6	6.39	10.9	2.8	33.03	30.5	2.9	33.11	57.8
3.1	32.43	25.0	3.3	20.09	54.6	3.6	6.76	11.2	3.8	33.36	30.4	3.8	34.00	57.6
4.1	31.62	24.7	4.3	19.75	54.8	4.6	7.12	11.5	4.8	33.72	30.2	4.8	34.96	57.4
5.1	30.81	24.5	5.3	19.38	55.0	5.6	7.47	11.8	5.8	34.10	30.1	5.8	36.01	57.1
6.1	30.02	24.2	6.3	18.98	55.2	6.6	7.79	12.1	6.8	34.48	29.9	6.8	37.12	56.9
7.1	29.29	23.9	7.3	18.55	55.4	7.6	8.06	12.4	7.8	34.88	29.8	7.8	38.28	56.7
8.1	28.63	23.6	8.3	18.12	55.5	8.6	8.27	12.7	8.8	35.28	29.8	8.8	39.46	56.5
9.1	28.04	23.4	9.3	17.70	55.7	9.5	8.43	13.1	9.8	35.66	29.7	9.8	40.64	56.4
10.1	27.52	23.1	10.3	17.28	55.8	10.5	8.56	13.4	10.8	36.03	29.7	10.8	41.78	56.2
11.1	27.06	22.8	11.3	16.89	55.9	11.5	8.67	13.7	11.8	36.39	29.6	11.8	42.87	56.1
12.1	26.62	22.5	12.3	16.51	56.0	12.5	8.77	14.0	12.8	36.73	29.6	12.8	43.91	56.0
13.1	26.19	22.2	13.3	16.15	56.1	13.5	8.89	14.2	13.8	37.05	29.6	13.8	44.89	55.9
14.1	25.75	22.0	14.3	15.81	56.2	14.5	9.03	14.5	14.8	37.37	29.5	14.8	45.83	55.8
15.1	25.28	21.8	15.3	15.48	56.3	15.5	9.20	14.8	15.8	37.69	29.5	15.8	46.78	55.6
16.1	24.77	21.5	16.3	15.13	56.5	16.5	9.39	15.1	16.8	38.02	29.4	16.8	47.76	55.5
17.1	24.23	21.3	17.3	14.76	56.6	17.5	9.58	15.4	17.8	38.37	29.3	17.8	48.78	55.3
18.1	23.68	21.0	18.3	14.38	56.8	18.5	9.76	15.7	18.8	38.73	29.3	18.8	49.86	55.2
19.1	23.12	20.7	19.3	13.97	56.9	19.5	9.92	16.1	19.8	39.11	29.2	19.8	51.03	55.0
20.1	22.61	20.4	20.3	13.54	57.0	20.5	10.04	16.4	20.8	39.51	29.2	20.8	52.26	54.9
21.1	22.16	20.1	21.3	13.10	57.1	21.5	10.11	16.8	21.7	39.90	29.2	21.8	53.52	54.8
22.1	21.77	19.8	22.3	12.65	57.2	22.5	10.13	17.1	22.7	40.28	29.2	22.8	54.79	54.7
23.1	21.47	19.5	23.3	12.20	57.2	23.5	10.11	17.5	23.7	40.66	29.3	23.8	56.04	54.6
24.1	21.23	19.2	24.3	11.77	57.3	24.5	10.04	17.8	24.7	41.02	29.3	24.8	57.25	54.6
25.0	21.05	18.9	25.3	11.36	57.3	25.5	9.97	18.1	25.7	41.36	29.4	25.8	58.40	54.5
26.0	20.88	18.6	26.3	10.97	57.3	26.5	9.89	18.4	26.7	41.69	29.4	26.8	59.50	54.5
27.0	20.71	18.3	27.3	10.58	57.3	27.5	9.83	18.7	27.7	42.01	29.5	27.8	60.56	54.4
28.0	20.52	18.0	28.3	10.20	57.4	28.5	9.80	18.9	28.7	42.32	29.5	28.8	61.59	54.4
29.0	20.30	17.7	29.3	9.84	57.4	29.5	9.78	19.2	29.7	42.64	29.5	29.8	62.65	54.3
30.0	20.03	17.5	30.3	9.46	57.4	30.5	9.79	19.5	30.7	42.97	29.5	30.8	63.74	54.3
31.0	19.73	17.2	31.3	9.06	57.5	31.5	9.80	19.8	31.7	43.33	29.5	31.8	64.89	54.2
32.0	19.42	16.9	32.3	8.64	57.6	32.5	9.80	20.1	32.7	43.70	29.6	32.8	66.10	54.1

(CONSTANTS OF STRUVE AND PETERS.)

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Ursæ Min. (*Polaris*).		Mean Solar Date.	51 Cephei (Hev.)		Mean Solar Date.	6 Ursæ Min. (B.).		Mean Solar Date.	δ Ursæ Min.		Mean Solar Date.	λ Ursæ Min.	
	Right Ascension.	Declination *North*.		Right Ascension.	Declination *North*.		Right Ascension.	Declination *North*.		Right Ascension.	Declination *North*.		Right Ascension.	Declination *North*.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Apr.	1 25	+88 49	Apr.	6 57	+87 11	Apr.	12 15	+88 12	Apr.	18 1	+86 36	Apr.	19 12	+88 59
	s	″		s	″		s	″		s	″		s	″
1.0	19.42	16.9	1.3	68.64	57.6	1.5	9.80	20.1	1.7	43.70	29.6	1.8	6.10	54.1
2.0	19.14	16.6	2.3	68.20	57.6	2.5	9.77	20.4	2.7	44.09	29.6	2.8	7.38	54.1
3.0	18.90	16.2	3.3	67.74	57.7	3.5	9.70	20.8	3.7	44.48	29.7	3.8	8.69	54.0
4.0	18.73	15.9	4.3	67.27	57.7	4.5	9.57	21.1	4.7	44.86	29.8	4.8	10.03	54.0
5.0	18.64	15.5	5.3	66.80	57.6	5.5	9.39	21.4	5.7	45.24	29.9	5.8	11.37	54.0
6.0	18.61	15.2	6.3	66.34	57.6	6.5	9.17	21.7	6.7	45.60	30.0	6.8	12.67	54.0
7.0	18.64	14.9	7.2	65.91	57.6	7.5	8.92	22.0	7.7	45.94	30.2	7.8	13.91	54.1
8.0	18.73	14.6	8.2	65.50	57.5	8.5	8.67	22.3	8.7	46.26	30.3	8.8	15.07	54.1
9.0	18.84	14.3	9.2	65.11	57.4	9.5	8.43	22.6	9.7	46.56	30.4	9.7	16.18	54.2
10.0	18.94	14.0	10.2	64.73	57.4	10.5	8.21	22.8	10.7	46.85	30.6	10.7	17.22	54.2
11.0	19.03	13.7	11.2	64.37	57.3	11.5	8.00	23.1	11.7	47.13	30.7	11.7	18.24	54.3
12.0	19.07	13.4	12.2	64.02	57.3	12.5	7.83	23.4	12.7	47.41	30.8	12.7	19.28	54.3
12.9	19.08	13.2	13.2	63.66	57.3	13.5	7.68	23.6	13.7	47.71	30.9	13.7	20.33	54.3
13.9	19.06	12.9	14.2	63.29	57.2	14.5	7.52	23.9	14.7	48.02	31.0	14.7	21.43	54.3
14.9	19.03	12.6	15.2	62.90	57.2	15.4	7.34	24.2	15.7	48.36	31.1	15.7	22.59	54.3
15.9	19.05	12.3	16.2	62.48	57.2	16.4	7.13	24.5	16.7	48.69	31.2	16.7	23.81	54.3
16.9	19.12	12.0	17.2	62.05	57.1	17.4	6.88	24.9	17.7	49.02	31.3	17.7	25.06	54.4
17.9	19.25	11.6	18.2	61.62	57.0	18.4	6.57	25.2	18.7	49.36	31.5	18.7	26.31	54.4
18.9	19.46	11.3	19.2	61.20	56.9	19.4	6.22	25.5	19.7	49.68	31.7	19.7	27.54	54.5
19.9	19.74	11.0	20.2	60.78	56.8	20.4	5.83	25.8	20.7	49.99	31.9	20.7	28.72	54.6
20.9	20.07	10.7	21.2	60.38	56.7	21.4	5.43	26.0	21.7	50.27	32.1	21.7	29.85	54.8
21.9	20.44	10.4	22.2	60.01	56.5	22.4	5.02	26.3	22.7	50.53	32.3	22.7	30.92	54.9
22.9	20.82	10.1	23.2	59.67	56.4	23.4	4.63	26.5	23.7	50.77	32.5	23.7	31.92	55.0
23.9	21.18	9.8	24.2	59.34	56.2	24.4	4.26	26.7	24.7	51.01	32.7	24.7	32.88	55.2
24.9	21.51	9.6	25.2	59.02	56.1	25.4	3.91	26.9	25.7	51.25	32.9	25.7	33.82	55.3
25.9	21.79	9.3	26.2	58.70	56.0	26.4	3.59	27.2	26.7	51.50	33.1	26.7	34.79	55.4
26.9	22.03	9.1	27.2	58.36	55.9	27.4	3.28	27.4	27.7	51.76	33.2	27.7	35.79	55.4
27.9	22.26	8.8	28.2	58.01	55.8	28.4	2.97	27.6	28.7	52.03	33.4	28.7	36.84	55.5
28.9	22.50	8.5	29.2	57.64	55.7	29.4	2.64	27.9	29.6	52.31	33.6	29.7	37.95	55.6
29.9	22.77	8.2	30.2	57.25	55.6	30.4	2.28	28.1	30.6	52.60	33.8	30.7	39.10	55.7
30.9	23.10	7.9	31.2	56.85	55.5	31.4	1.88	28.4	31.6	52.89	34.0	31.7	40.28	55.9
31.9	23.49	7.6	32.2	56.46	55.3	32.4	1.42	28.6	32.6	53.17	34.3	32.7	41.45	56.0

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Ursæ Min. (*Polaris*).		Mean Solar Date.	51 Cephei (Hev.).		Mean Solar Date.	6 Ursæ Min. (B.).		Mean Solar Date.	δ Ursæ Min.		Mean Solar Date.	λ Ursæ Min.	
	Right Ascension.	Declination *North*,		Right Ascension.	Declination *North*.		Right Ascension.	Declination *North*.		Right Ascension.	Declination *North*		Right Ascension.	Declination *North*.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
May	1 25	+88 49	May	6 57	+87 11	May	12 14	+88 12	May	18 1	+86 36	May	19 12	+88 59
	s	″		s	″		s	″		s	″		s	″
1.9	23.49	7.6	1.2	56.85	55.5	1.4	61.88	28.4	1.6	52.89	34.0	1.7	40.28	55.9
2.9	23.96	7.3	2.2	56.46	55.3	2.4	61.42	28.6	2.6	53.17	34.3	2.7	41.45	56.0
3.9	24.50	7.0	3.2	56.08	55.1	3.4	60.92	28.9	3.6	53.43	34.5	3.7	42.58	56.2
4.9	25.08	6.7	4.2	55.72	54.9	4.4	60.39	29.1	4.6	53.68	34.8	4.7	43.64	56.4
5.9	25.70	6.5	5.2	55.38	54.7	5.4	59.85	29.3	5.6	53.90	35.1	5.7	44.63	56.6
6.9	26.31	6.2	6.2	55.07	54.5	6.4	59.30	29.5	6.6	54.09	35.3	6.7	45.54	56.8
7.9	26.90	6.0	7.2	54.79	54.3	7.4	58.79	29.6	7.6	54.26	35.6	7.7	46.37	57.0
8.9	27.46	5.8	8.2	54.52	54.1	8.4	58.31	29.8	8.6	54.43	35.9	8.7	47.15	57.2
9.9	27.98	5.6	9.2	54.28	53.9	9.4	57.85	30.0	9.6	54.59	36.1	9.7	47.92	57.4
10.9	28.46	5.4	10.2	54.04	53.8	10.4	57.41	30.1	10.6	54.76	36.3	10.7	48.71	57.5
11.9	28.93	5.2	11.2	53.78	53.6	11.4	56.98	30.3	11.6	54.95	36.5	11.7	49.53	57.7
12.9	29.41	4.9	12.2	53.51	53.4	12.4	56.55	30.5	12.6	55.15	36.7	12.7	50.39	57.8
13.9	29.93	4.7	13.1	53.22	53.3	13.4	56.10	30.7	13.6	55.35	37.0	13.7	51.30	58.0
14.9	30.51	4.4	14.1	52.92	53.1	14.4	55.62	30.9	14.6	55.56	37.2	14.7	52.23	58.2
15.9	31.17	4.2	15.1	52.61	52.9	15.4	55.09	31.1	15.6	55.76	37.5	15.7	53.18	58.4
16.9	31.89	3.9	16.1	52.30	52.7	16.4	54.51	31.3	16.6	55.94	37.8	16.7	54.11	58.6
17.9	32.66	3.7	17.1	52.02	52.4	17.4	53.91	31.5	17.6	56.11	38.1	17.6	54.99	58.9
18.9	33.48	3.5	18.1	51.76	52.1	18.4	53.27	31.6	18.6	56.26	38.4	18.6	55.81	59.1
19.9	34.31	3.3	19.1	51.51	51.9	19.4	52.63	31.7	19.6	56.38	38.7	19.6	56.55	59.4
20.9	35.11	3.1	20.1	51.29	51.6	20.4	52.01	31.9	20.6	56.49	39.0	20.6	57.21	59.6
21.9	35.89	2.9	21.1	51.11	51.3	21.3	51.41	32.0	21.6	56.58	39.3	21.6	57.82	59.9
22.9	36.63	2.8	22.1	50.94	51.1	22.3	50.84	32.0	22.6	56.67	39.6	22.6	58.40	60.2
23.9	37.32	2.6	23.1	50.77	50.9	23.3	50.31	32.1	23.6	56.76	39.9	23.6	58.97	60.4
24.9	37.98	2.5	24.1	50.59	50.6	24.3	49.79	32.2	24.6	56.86	40.1	24.6	59.56	60.6
25.9	38.62	2.3	25.1	50.40	50.4	25.3	49.28	32.3	25.6	56.97	40.4	25.6	60.20	60.8
26.9	39.29	2.1	26.1	50.20	50.2	26.3	48.76	32.4	26.6	57.10	40.6	26.6	60.89	61.0
27.9	39.99	1.9	27.1	49.98	50.0	27.3	48.22	32.5	27.6	57.25	40.9	27.6	61.61	61.2
28.9	40.75	1.7	28.1	49.75	49.8	28.3	47.64	32.7	28.6	57.38	41.2	28.6	62.35	61.5
29.9	41.59	1.5	29.1	49.51	49.5	29.3	47.02	32.8	29.6	57.51	41.5	29.6	63.10	61.7
30.9	42.49	1.3	30.1	49.29	49.2	30.3	46.37	32.9	30.6	57.62	41.8	30.6	63.81	62.0
31.9	43.44	1.1	31.1	49.09	48.9	31.3	45.68	33.0	31.6	57.71	42.2	31.6	64.47	62.3
32.9	44.42	1.0	32.1	48.91	48.6	32.3	44.98	33.0	32.6	57.77	42.5	32.6	65.04	62.6

(CONSTANTS OF STRUVE AND PETERS.)

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Ursæ Min. (*Polaris*).		Mean Solar Date.	51 Cephei (Hev.).		Mean Solar Date.	6 Ursæ Min. (B.).		Mean Solar Date.	δ Ursæ Min.		Mean Solar Date.	λ Ursæ Min.	
	Right Ascension.	Declination *North*.		Right Ascension.	Declination *North*.		Right Ascension.	Declination *North*.		Right Ascension.	Declination *North*.		Right Ascension.	Declination *North*.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
June	1 25	+88 48	June	6 57	+87 11	June	12 14	+88 12	June	18 1	+86 36	June	19 13	+89 0
	s	″		s	″		s	″		s	″		s	″
1.9	44.42	61.0	1.1	48.91	48.6	1.3	44.98	33.0	1.6	57.77	42.5	1.6	5.04	2.6
2.9	45.40	60.8	2.1	48.76	48.3	2.3	44.28	33.1	2.6	57.81	42.9	2.6	5.53	2.9
3.9	46.35	60.7	3.1	48.64	48.0	3.3	43.60	33.1	3.6	57.83	43.2	3.6	5.94	3.2
4.9	47.28	60.6	4.1	48.55	47.7	4.3	42.95	33.1	4.6	57.84	43.5	4.6	6.28	3.5
5.9	48.16	60.6	5.1	48.49	47.4	5.3	42.34	33.1	5.5	57.84	43.8	5.6	6.58	3.8
6.9	48.99	60.5	6.1	48.42	47.2	6.3	41.76	33.2	6.5	57.84	44.1	6.6	6.88	4.1
7.8	49.79	60.4	7.1	48.35	46.9	7.3	41.21	33.2	7.5	57.85	44.4	7.6	7.20	4.4
8.8	50.59	60.3	8.1	48.27	46.7	8.3	40.65	33.2	8.5	57.87	44.6	8.6	7.54	4.6
9.8	51.41	60.1	9.1	48.17	46.4	9.3	40.08	33.3	9.5	57.89	44.9	9.6	7.93	4.8
10.8	52.28	60.0	10.1	48.05	46.2	10.3	39.50	33.3	10.5	57.92	45.2	10.6	8.36	5.1
11.8	53.20	59.9	11.1	47.94	45.9	11.3	38.88	33.4	11.5	57.96	45.5	11.6	8.80	5.4
12.8	54.19	59.8	12.1	47.83	45.6	12.3	38.22	33.4	12.5	57.98	45.8	12.6	9.23	5.7
13.8	55.24	59.7	13.1	47.73	45.3	13.3	37.52	33.4	13.5	57.98	46.2	13.6	9.61	6.0
14.8	56.33	59.6	14.1	47.64	45.0	14.3	36.79	33.5	14.5	57.97	46.6	14.6	9.92	6.4
15.8	57.44	59.5	15.1	47.58	44.6	15.3	36.07	33.5	15.5	57.92	46.9	15.6	10.18	6.7
16.8	58.53	59.5	16.1	47.56	44.3	16.3	35.36	33.4	16.5	57.86	47.3	16.6	10.35	7.0
17.8	59.58	59.4	17.0	47.57	44.0	17.3	34.67	33.4	17.5	57.79	47.6	17.6	10.44	7.4
18.8	60.59	59.4	18.0	47.59	43.6	18.3	34.00	33.3	18.5	57.71	47.9	18.6	10.48	7.7
19.8	61.54	59.4	19.0	47.61	43.3	19.3	33.38	33.2	19.5	57.62	48.2	19.6	10.51	8.0
20.8	62.44	59.4	20.0	47.64	43.1	20.3	32.80	33.2	20.5	57.55	48.5	20.6	10.55	8.3
21.8	63.33	59.3	21.0	47.66	42.8	21.3	32.23	33.1	21.5	57.48	48.7	21.6	10.61	8.6
22.8	64.21	59.3	22.0	47.66	42.5	22.3	31.66	33.1	22.5	57.43	49.0	22.6	10.73	8.8
23.8	65.12	59.2	23.0	47.64	42.3	23.3	31.09	33.0	23.5	57.38	49.3	23.5	10.89	9.1
24.8	66.07	59.2	24.0	47.62	42.0	24.3	30.49	33.0	24.5	57.35	49.6	24.5	11.08	9.4
25.8	67.07	59.1	25.0	47.59	41.7	25.3	29.85	33.0	25.5	57.31	49.9	25.5	11.27	9.7
26.8	68.14	59.0	26.0	47.56	41.4	26.3	29.18	32.9	26.5	57.25	50.2	26.5	11.44	10.0
27.8	69.25	59.0	27.0	47.55	41.0	27.2	28.48	32.9	27.5	57.17	50.6	27.5	11.56	10.4
28.8	70.40	59.0	28.0	47.57	40.7	28.2	27.75	32.8	28.5	57.07	50.9	28.5	11.60	10.7
29.8	71.56	59.0	29.0	47.62	40.3	29.2	27.04	32.7	29.5	56.95	51.3	29.5	11.56	11.1
30.8	72.70	59.0	30.0	47.70	40.0	30.2	26.34	32.5	30.5	56.80	51.6	30.5	11.43	11.4
31.8	73.80	59.1	31.0	47.80	39.7	31.2	25.68	32.4	31.5	56.63	51.9	31.5	11.22	11.8

(CONSTANTS OF STRUVE AND PETERS.)

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	*a* Ursæ Min. (*Polaris*).		Mean Solar Date.	51 Cephei (Hev.).		Mean Solar Date.	6 Ursæ Min. (B.).		Mean Solar Date.	*δ* Ursæ Min.		Mean Solar Date.	*λ* Ursæ Min.	
	Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
July	1 26	+88 48	July	6 57	+87 11	July	12 14	+88 12	July	18 1	+86 36	July	19 12	+89 0
	s	″		s	″		s	″		s	″		s	″
1.8	13.80	59.1	1.0	47.80	39.7	1.2	25.68	32.4	1.5	56.63	51.9	1.5	71.22	11.8
2.8	14.85	59.1	2.0	47.93	39.4	2.2	25.05	32.3	2.5	56.46	52.2	2.5	70.96	12.1
3.8	15.83	59.2	3.0	48.07	39.1	3.2	24.46	32.1	3.5	56.29	52.5	3.5	70.69	12.4
4.8	16.78	59.2	4.0	48.21	38.8	4.2	23.90	32.0	4.5	56.12	52.7	4.5	70.42	12.7
5.8	17.70	59.3	5.0	48.33	38.5	5.2	23.36	31.9	5.5	55.96	53.0	5.5	70.18	12.9
6.8	18.64	59.3	5.9	48.45	38.2	6.2	22.82	31.8	6.5	55.81	53.2	6.5	69.97	13.2
7.8	19.61	59.4	6.9	48.56	38.0	7.2	22.27	31.7	7.5	55.68	53.5	7.5	69.81	13.5
8.8	20.61	59.4	7.9	48.66	37.7	8.2	21.69	31.6	8.5	55.54	53.8	8.5	69.67	13.8
9.8	21.67	59.4	8.9	48.75	37.4	9.2	21.07	31.4	9.5	55.39	54.1	9.5	69.53	14.2
10.8	22.79	59.4	9.9	48.85	37.1	10.2	20.42	31.3	10.5	55.24	54.4	10.5	69.35	14.5
11.8	23.95	59.5	10.9	48.97	36.7	11.2	19.75	31.2	11.5	55.07	54.7	11.5	69.12	14.9
12.8	25.13	59.6	11.9	49.11	36.4	12.2	19.07	31.0	12.4	54.87	55.0	12.5	68.81	15.2
13.8	26.31	59.7	12.9	49.27	36.0	13.2	18.40	30.9	13.4	54.64	55.4	13.5	68.43	15.6
14.8	27.45	59.8	13.9	49.47	35.7	14.2	17.75	30.7	14.4	54.39	55.7	14.5	67.97	15.9
15.7	28.54	59.9	14.9	49.70	35.4	15.2	17.14	30.5	15.4	54.13	56.0	15.5	67.44	16.3
16.7	29.56	60.0	15.9	49.93	35.1	16.2	16.58	30.3	16.4	53.88	56.2	16.5	66.90	16.6
17.7	30.53	60.1	16.9	50.16	34.8	17.2	16.05	30.0	17.4	53.64	56.5	17.5	66.35	16.9
18.7	31.45	60.3	17.9	50.39	34.5	18.2	15.55	29.8	18.4	53.41	56.7	18.5	65.82	17.2
19.7	32.36	60.4	18.9	50.61	34.2	19.2	15.06	29.6	19.4	53.19	56.9	19.5	65.34	17.5
20.7	33.27	60.5	19.9	50.81	34.0	20.2	14.58	29.4	20.4	52.98	57.1	20.5	64.91	17.7
21.7	34.21	60.6	20.9	51.00	33.7	21.2	14.08	29.3	21.4	52.77	57.4	21.5	64.51	18.0
22.7	35.21	60.6	21.9	51.17	33.5	22.2	13.55	29.1	22.4	52.57	57.6	22.5	64.13	18.3
23.7	36.25	60.7	22.9	51.35	33.2	23.2	12.99	28.9	23.4	52.36	57.9	23.5	63.75	18.6
24.7	37.34	60.8	23.9	51.54	32.9	24.2	12.39	28.7	24.4	52.14	58.2	24.5	63.33	18.9
25.7	38.47	60.9	24.9	51.74	32.5	25.2	11.77	28.5	25.4	51.90	58.4	25.5	62.84	19.3
26.7	39.61	61.1	25.9	51.97	32.2	26.2	11.16	28.3	26.4	51.63	58.7	26.5	62.26	19.6
27.7	40.74	61.3	26.9	52.24	31.9	27.2	10.56	28.0	27.4	51.34	59.0	27.5	61.60	20.0
28.7	41.82	61.4	27.9	52.53	31.6	28.2	10.00	27.7	28.4	51.03	59.3	28.5	60.87	20.3
29.7	42.85	61.6	28.9	52.84	31.3	29.2	9.47	27.4	29.4	50.70	59.5	29.5	60.07	20.6
30.7	43.81	61.8	29.9	53.17	31.0	30.2	9.00	27.2	30.4	50.37	59.7	30.5	59.24	20.9
31.7	44.73	62.0	30.9	53.50	30.8	31.2	8.56	26.9	31.4	50.05	59.9	31.4	58.41	21.2
32.7	45.61	62.2	31.9	53.82	30.5	32.1	8.15	26.6	32.4	49.75	60.1	32.4	57.61	21.4

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Ursæ Min. (*Polaris*).		Mean Solar Date.	51 Cephei (Hev.).		Mean Solar Date.	6 Ursæ Min. (B.).		Mean Solar Date.	δ Ursæ Min.		Mean Solar Date.	λ Ursæ Min.	
	Right Ascension.	Declination *North*.		Right Ascension.	Declination *North*.		Right Ascension.	Declination *North*.		Right Ascension.	Declination *North*.		Right Ascension.	Declination *North*.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Aug.	1 26	+88 49	Aug.	6 57	+87 11	Aug.	12 13	+88 12	Aug.	18 1	+86 37	Aug.	19 12	+89 0
	s	″		s	″		s	″		s	″		s	″
1.7	45.61	2.2	1.9	54.13	30.3	1.1	68.15	26.6	1.4	49.75	0.1	1.4	57.61	21.4
2.7	46.46	2.4	2.9	54.43	30.0	2.1	67.74	26.4	2.4	49.46	0.3	2.4	56.83	21.7
3.7	47.34	2.6	3.9	54.71	29.8	3.1	67.33	26.1	3.4	49.17	0.5	3.4	56.11	21.9
4.7	48.25	2.8	4.9	54.99	29.6	4.1	66.90	25.9	4.4	48.89	0.7	4.4	55.42	22.2
5.7	49.19	2.9	5.9	55.27	29.3	5.1	66.44	25.7	5.4	48.61	0.9	5.4	54.74	22.5
6.7	50.20	3.1	6.9	55.56	29.0	6.1	65.95	25.5	6.4	48.32	1.1	6.4	54.04	22.8
7.7	51.25	3.3	7.9	55.87	28.7	7.1	65.44	25.2	7.4	48.01	1.4	7.4	53.30	23.1
8.7	52.32	3.5	8.9	56.21	28.4	8.1	64.91	24.9	8.4	47.69	1.6	8.4	52.49	23.4
9.7	53.39	3.7	9.9	56.57	28.1	9.1	64.39	24.7	9.4	47.34	1.9	9.4	51.61	23.7
10.7	54.42	3.9	10.9	56.95	27.8	10.1	63.89	24.4	10.4	46.98	2.1	10.4	50.66	24.0
11.7	55.41	4.2	11.9	57.36	27.6	11.1	63.43	24.0	11.4	46.60	2.3	11.4	49.64	24.3
12.7	56.34	4.4	12.9	57.78	27.4	12.1	63.01	23.7	12.4	46.22	2.5	12.4	48.57	24.6
13.7	57.19	4.7	13.9	58.18	27.1	13.1	62.63	23.4	13.4	45.83	2.6	13.4	47.51	24.8
14.7	57.99	5.0	14.9	58.57	26.9	14.1	62.30	23.0	14.4	45.46	2.8	14.4	46.47	25.1
15.7	58.75	5.2	15.9	58.95	26.7	15.1	61.99	22.7	15.4	45.11	2.9	15.4	45.47	25.3
16.7	59.50	5.4	16.9	59.31	26.5	16.1	61.69	22.4	16.4	44.78	3.0	16.4	44.51	25.5
17.7	60.28	5.7	17.9	59.65	26.3	17.1	61.38	22.1	17.3	44.46	3.2	17.4	43.60	25.7
18.7	61.09	5.9	18.9	59.99	26.1	18.1	61.05	21.8	18.3	44.14	3.3	18.4	42.71	26.0
19.6	61.94	6.1	19.9	60.33	25.9	19.1	60.68	21.5	19.3	43.81	3.5	19.4	41.84	26.2
20.6	62.84	6.3	20.9	60.69	25.6	20.1	60.29	21.2	20.3	43.48	3.7	20.4	40.94	26.5
21.6	63.77	6.5	21.9	61.07	25.4	21.1	59.88	20.9	21.3	43.13	3.8	21.4	40.00	26.7
22.6	64.73	6.8	22.9	61.48	25.1	22.1	59.46	20.6	22.3	42.76	4.0	22.4	39.00	27.0
23.6	65.67	7.1	23.9	61.91	24.9	23.1	59.05	20.3	23.3	42.37	4.2	23.4	37.90	27.3
24.6	66.57	7.4	24.9	62.36	24.6	24.1	58.67	19.9	24.3	41.96	4.4	24.4	36.73	27.6
25.6	67.42	7.7	25.9	62.84	24.4	25.1	58.33	19.5	25.3	41.53	4.5	25.4	35.50	27.8
26.6	68.20	8.0	26.9	63.33	24.2	26.1	58.04	19.1	26.3	41.10	4.6	26.4	34.22	28.0
27.6	68.92	8.4	27.9	63.80	24.1	27.1	57.80	18.8	27.3	40.68	4.7	27.4	32.94	28.2
28.6	69.58	8.7	28.9	64.26	23.9	28.1	57.60	18.4	28.3	40.26	4.8	28.4	31.68	28.4
29.6	70.21	9.0	29.9	64.71	23.8	29.1	57.41	18.1	29.3	39.86	4.9	29.4	30.46	28.6
30.6	70.85	9.3	30.8	65.14	23.6	30.1	57.22	17.7	30.3	39.48	5.0	30.4	29.28	28.8
31.6	71.51	9.5	31.8	65.55	23.5	31.1	57.03	17.4	31.3	39.10	5.1	31.4	28.15	29.0
32.6	72.21	9.8	32.8	65.97	23.3	32.1	56.81	17.1	32.3	38.73	5.1	32.4	27.05	29.2

(CONSTANTS OF STRUVE AND PETERS.)

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Ursæ Min. (*Polaris*).		Mean Solar Date.	51 Cephei (Hev.).		Mean Solar Date.	6 Ursæ Min. (B.).		Mean Solar Date.	δ Ursæ Min.		Mean Solar Date.	λ Ursæ Min.	
	Right Ascension.	Declination *North*.		Right Ascension.	Declination *North*.		Right Ascension.	Declination *North*.		Right Ascension.	Declination *North*.		Right Ascension.	Declination *North*.
	h m	° '		h m	° '		h m	° '		h m	° '		h m	° '
Sept.	1 27	+88 49	Sept.	6 58	+87 11	Sept.	12 13	+88 12	Sept.	18 1	+86 37	Sept.	19 11	+89 0
	s	"		s	"		s	"		s	"		s	"
1.6	12.21	9.8	1.8	5.97	23.3	1.1	56.81	17.1	1.3	38.73	5.1	1.4	87.05	29.2
2.6	12.96	10.1	2.8	6.39	23.1	2.1	56.55	16.8	2.3	38.36	5.2	2.4	85.95	29.4
3.6	13.75	10.4	3.8	6.83	22.9	3.1	56.27	16.4	3.3	37.97	5.4	3.4	84.81	29.6
4.6	14.56	10.7	4.8	7.29	22.7	4.1	55.97	16.1	4.3	37.56	5.5	4.4	83.62	29.8
5.6	15.37	11.0	5.8	7.77	22.5	5.0	55.68	15.8	5.3	37.14	5.6	5.3	82.37	30.0
6.6	16.17	11.3	6.8	8.27	22.3	6.0	55.40	15.4	6.3	36.69	5.7	6.3	81.05	30.2
7.6	16.91	11.7	7.8	8.80	22.1	7.0	55.16	15.0	7.3	36.23	5.8	7.3	79.67	30.4
8.6	17.59	12.0	8.8	9.33	22.0	8.0	54.96	14.6	8.3	35.77	5.9	8.3	78.23	30.6
9.6	18.20	12.4	9.8	9.85	21.8	9.0	54.81	14.2	9.3	35.32	5.9	9.3	76.79	30.8
10.6	18.74	12.8	10.8	10.37	21.7	10.0	54.71	13.8	10.3	34.88	6.0	10.3	75.38	31.0
11.6	19.23	13.1	11.8	10.87	21.6	11.0	54.64	13.4	11.3	34.45	6.0	11.3	73.98	31.1
12.6	19.70	13.5	12.8	11.34	21.5	12.0	54.57	13.0	12.3	34.04	6.0	12.3	72.63	31.2
13.6	20.17	13.8	13.8	11.80	21.4	13.0	54.50	12.6	13.3	33.65	6.0	13.3	71.35	31.4
14.6	20.66	14.1	14.8	12.24	21.3	14.0	54.43	12.3	14.3	33.26	6.0	14.3	70.11	31.5
15.6	21.19	14.4	15.8	12.69	21.2	15.0	54.34	11.9	15.3	32.88	6.1	15.3	68.91	31.6
16.6	21.77	14.7	16.8	13.14	21.0	16.0	54.21	11.6	16.3	32.49	6.1	16.3	67.71	31.8
17.6	22.39	15.0	17.8	13.61	20.9	17.0	54.06	11.2	17.3	32.09	6.2	17.3	66.46	31.9
18.6	23.02	15.3	18.8	14.10	20.7	18.0	53.89	10.8	18.3	31.68	6.2	18.3	65.16	32.1
19.6	23.65	15.7	19.8	14.62	20.6	19.0	53.73	10.4	19.3	31.25	6.3	19.3	63.79	32.2
20.6	24.24	16.1	20.8	15.17	20.5	20.0	53.60	10.0	20.3	30.79	6.3	20.3	62.34	32.4
21.6	24.79	16.4	21.8	15.72	20.4	21.0	53.51	9.6	21.3	30.32	6.4	21.3	60.82	32.6
22.6	25.28	16.8	22.8	16.29	20.3	22.0	53.47	9.2	22.3	29.85	6.4	22.3	59.27	32.7
23.6	25.68	17.2	23.8	16.86	20.2	23.0	53.46	8.8	23.2	29.39	6.3	23.3	57.69	32.8
24.6	26.03	17.6	24.8	17.41	20.1	24.0	53.50	8.4	24.2	28.93	6.3	24.3	56.15	32.9
25.5	26.34	18.0	25.8	17.94	20.1	25.0	53.57	8.0	25.2	28.49	6.2	25.3	54.65	32.9
26.5	26.62	18.4	26.8	18.46	20.1	26.0	53.65	7.6	26.2	28.07	6.2	26.3	53.19	33.0
27.5	26.93	18.7	27.8	18.96	20.0	26.9	53.73	7.2	27.2	27.66	6.1	27.3	51.79	33.1
28.5	27.26	19.1	28.8	19.45	20.0	27.9	53.80	6.9	28.2	27.26	6.1	28.3	50.42	33.1
29.5	27.62	19.4	29.8	19.93	19.9	28.9	53.82	6.5	29.2	26.86	6.1	29.3	49.08	33.2
30.5	28.03	19.8	30.8	20.43	19.8	29.9	53.82	6.2	30.2	26.45	6.0	30.3	47.72	33.3
31.5	28.46	20.1	31.8	20.95	19.7	30.9	53.81	5.8	31.2	26.04	6.0	31.3	46.34	33.4
32.5	28.91	20.5	32.8	21.48	19.6	31.9	53.78	5.4	32.2	25.60	6.0	32.3	44.90	33.5

(CONSTANTS OF STRUVE AND PETERS.)

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Ursæ Min. (*Polaris*).		Mean Solar Date.	51 Cephei (Hev.).		Mean Solar Date.	6 Ursæ Min. (B.).		Mean Solar Date.	δ Ursæ Min.		Mean Solar Date.	λ Ursæ Min.	
	Right Ascension.	Declination *North*.		Right Ascension.	Declination *North*.		Right Ascension.	Declination *North*.		Right Ascension.	Declination *North*.		Right Ascension.	Declination *North*.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Oct.	1 27	+88 49	Oct.	6 58	+87 11	Oct.	12 13	+88 11	Oct.	18 1	+86 37	Oct.	19 11	+89 0
	s	″		s	″		s	″		s	″		s	″
1.5	28.46	20.1	1.8	20.95	19.7	1.9	53.78	65.4	1.2	26.04	6.0	1.3	46.34	33.4
2.5	28.91	20.5	2.8	21.48	19.6	2.9	53.77	65.0	2.2	25.60	6.0	2.3	44.90	33.5
3.5	29.34	20.9	3.8	22.04	19.6	3.9	53.79	64.6	3.2	25.15	6.0	3.3	43.39	33.6
4.5	29.73	21.3	4.8	22.61	19.5	4.9	53.85	64.2	4.2	24.68	5.9	4.3	41.82	33.7
5.5	30.05	21.7	5.8	23.20	19.5	5.9	53.96	63.8	5.2	24.21	5.9	5.3	40.21	33.8
6.5	30.31	22.1	6.8	23.79	19.4	6.9	54.12	63.4	6.2	23.75	5.8	6.3	38.58	33.8
7.5	30.49	22.5	7.7	24.36	19.4	7.9	54.32	63.0	7.2	23.29	5.7	7.3	36.97	33.9
8.5	30.61	23.0	8.7	24.91	19.5	8.9	54.54	62.6	8.2	22.84	5.6	8.3	35.38	33.9
9.5	30.69	23.4	9.7	25.44	19.5	9.9	54.76	62.2	9.2	22.42	5.5	9.3	33.85	33.9
10.5	30.76	23.7	10.7	25.94	19.5	10.9	54.97	61.8	10.2	22.02	5.4	10.3	32.41	33.9
11.5	30.84	24.1	11.7	26.43	19.5	11.9	55.16	61.5	11.2	21.64	5.2	11.3	31.03	33.9
12.5	30.95	24.4	12.7	26.91	19.5	12.9	55.31	61.1	12.2	21.27	5.1	12.3	29.67	33.9
13.5	31.11	24.8	13.7	27.39	19.5	13.9	55.45	60.7	13.2	20.90	5.0	13.2	28.33	33.9
14.5	31.30	25.1	14.7	27.89	19.5	14.9	55.57	60.4	14.2	20.52	5.0	14.2	26.98	33.9
15.5	31.51	25.5	15.7	28.40	19.5	15.9	55.70	60.0	15.2	20.11	4.9	15.2	25.60	34.0
16.5	31.73	25.9	16.7	28.93	19.5	16.9	55.84	59.6	16.2	19.70	4.8	16.2	24.16	34.0
17.5	31.92	26.3	17.7	29.48	19.5	17.9	56.01	59.2	17.2	19.28	4.7	17.2	22.65	34.0
18.5	32.06	26.7	18.7	30.06	19.5	18.9	56.23	58.8	18.2	18.84	4.6	18.2	21.08	34.0
19.5	32.15	27.1	19.7	30.64	19.5	19.9	56.50	58.4	19.2	18.39	4.5	19.2	19.47	34.0
20.5	32.16	27.5	20.7	31.22	19.6	20.9	56.81	58.0	20.2	17.95	4.3	20.2	17.84	34.0
21.5	32.10	27.9	21.7	31.79	19.6	21.9	57.15	57.6	21.2	17.52	4.2	21.2	16.22	34.0
22.5	32.00	28.3	22.7	32.34	19.7	22.9	57.50	57.2	22.2	17.11	4.0	22.2	14.64	33.9
23.5	31.85	28.7	23.7	32.87	19.8	23.9	57.86	56.9	23.2	16.71	3.8	23.2	13.12	33.9
24.5	31.70	29.1	24.7	33.37	19.9	24.9	58.22	56.6	24.2	16.34	3.6	24.2	11.66	33.8
25.5	31.58	29.5	25.7	33.86	20.0	25.9	58.55	56.2	25.2	15.98	3.4	25.2	10.26	33.7
26.5	31.49	29.8	26.7	34.34	20.1	26.9	58.84	55.9	26.2	15.62	3.2	26.2	8.90	33.7
27.5	31.44	30.2	27.7	34.82	20.1	27.9	59.11	55.6	27.2	15.27	3.1	27.2	7.55	33.6
28.5	31.43	30.5	28.7	35.31	20.2	28.9	59.37	55.2	28.2	14.90	2.9	28.2	6.18	33.6
29.5	31.44	30.9	29.7	35.83	20.2	29.9	59.64	54.9	29.1	14.52	2.8	29.2	4.77	33.5
30.5	31.43	31.3	30.7	36.37	20.3	30.9	59.93	54.5	30.1	14.13	2.7	30.2	3.32	33.5
31.5	31.39	31.7	31.7	36.92	20.3	31.9	60.25	54.2	31.1	13.72	2.5	31.2	1.81	33.4
32.4	31.29	32.1	32.7	37.47	20.4	32.9	60.61	53.8	32.1	13.32	2.3	32.2	0.25	33.4

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	*α* Ursæ Min. (*Polaris*).		Mean Solar Date.	51 Cephei (Hev.).		Mean Solar Date.	6 Ursæ Min. (B.).		Mean Solar Date.	*δ* Ursæ Min.		Mean Solar Date.	*λ* Ursæ Min.	
	Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Nov.	1 27	+88 49	Nov.	6 58	+87 11	Nov.	12 14	+88 11	Nov.	18 1	+86 36	Nov.	19 10	+89 0
	s	″		s	″		s	″		s	″		s	″
1.4	31.29	32.1	1.7	37.47	20.4	1.9	0.61	53.8	1.1	13.32	62.3	1.2	60.25	33.4
2.4	31.12	32.5	2.7	38.03	20.5	2.9	1.03	53.4	2.1	12.91	62.1	2.2	58.67	33.3
3.4	30.87	32.9	3.7	38.58	20.6	3.9	1.50	53.0	3.1	12.51	61.9	3.2	57.10	33.2
4.4	30.56	33.3	4.7	39.10	20.8	4.9	1.99	52.7	4.1	12.13	61.6	4.2	55.58	33.1
5.4	30.19	33.7	5.7	39.60	20.9	5.9	2.48	52.4	5.1	11.77	61.4	5.2	54.11	33.0
6.4	29.80	34.1	6.7	40.08	21.1	6.9	2.98	52.1	6.1	11.44	61.1	6.2	52.72	32.8
7.4	29.42	34.4	7.7	40.54	21.3	7.9	3.46	51.8	7.1	11.13	60.9	7.2	51.40	32.7
8.4	29.06	34.8	8.7	40.97	21.4	8.9	3.90	51.5	8.1	10.83	60.6	8.2	50.15	32.5
9.4	28.74	35.1	9.7	41.40	21.5	9.9	4.32	51.2	9.1	10.54	60.4	9.2	48.93	32.4
10.4	28.46	35.4	10.7	41.83	21.7	10.9	4.72	50.9	10.1	10.25	60.2	10.2	47.72	32.2
11.4	28.21	35.7	11.6	42.28	21.8	11.9	5.10	50.6	11.1	9.95	60.0	11.2	46.49	32.1
12.4	27.97	36.1	12.6	42.75	21.9	12.9	5.50	50.2	12.1	9.64	59.8	12.2	45.22	32.0
13.4	27.72	36.4	13.6	43.23	22.0	13.9	5.92	49.9	13.1	9.31	59.6	13.2	43.89	31.9
14.4	27.43	36.8	14.6	43.73	22.1	14.9	6.39	49.5	14.1	8.97	59.4	14.2	42.50	31.8
15.4	27.08	37.2	15.6	44.24	22.3	15.9	6.90	49.2	15.1	8.62	59.1	15.2	41.08	31.7
16.4	26.67	37.6	16.6	44.75	22.5	16.9	7.46	48.9	16.1	8.27	58.9	16.2	39.65	31.6
17.4	26.17	38.0	17.6	45.24	22.7	17.9	8.05	48.6	17.1	7.94	58.6	17.1	38.23	31.4
18.4	25.61	38.3	18.6	45.71	22.9	18.9	8.66	48.3	18.1	7.62	58.3	18.1	36.84	31.2
19.4	25.01	38.7	19.6	46.16	23.1	19.8	9.28	48.0	19.1	7.33	58.0	19.1	35.52	31.0
20.4	24.40	39.0	20.6	46.59	23.4	20.8	9.90	47.8	20.1	7.06	57.7	20.1	34.26	30.7
21.4	23.81	39.3	21.6	47.00	23.6	21.8	10.49	47.6	21.1	6.81	57.4	21.1	33.08	30.5
22.4	23.24	39.6	22.6	47.38	23.8	22.8	11.03	47.3	22.1	6.57	57.1	22.1	31.95	30.3
23.4	22.71	39.9	23.6	47.76	24.0	23.8	11.56	47.1	23.1	6.33	56.8	23.1	30.86	30.1
24.4	22.23	40.2	24.6	48.15	24.1	24.8	12.07	46.9	24.1	6.10	56.5	24.1	29.77	29.9
25.4	21.77	40.5	25.6	48.56	24.3	25.8	12.57	46.6	25.1	5.85	56.3	25.1	28.66	29.8
26.4	21.32	40.8	26.6	48.98	24.5	26.8	13.08	46.4	26.1	5.59	56.0	26.1	27.51	29.6
27.4	20.84	41.2	27.6	49.41	24.7	27.8	13.62	46.1	27.1	5.32	55.8	27.1	26.32	29.4
28.4	20.31	41.5	28.6	49.85	24.9	28.8	14.20	45.8	28.1	5.04	55.5	28.1	25.08	29.2
29.4	19.73	41.8	29.6	50.30	25.1	29.8	14.84	45.6	29.1	4.76	55.2	29.1	23.82	29.0
30.4	19.06	42.2	30.6	50.73	25.4	30.8	15.51	45.3	30.1	4.49	54.9	30.1	22.56	28.8
31.4	18.33	42.5	31.6	51.14	25.6	31.8	16.21	45.1	31.1	4.24	54.5	31.1	21.35	28.6

(CONSTANTS OF STRUVE AND PETERS.)

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	*α* Ursæ Min. (*Polaris*).		Mean Solar Date.	51 Cephei (Hev.).		Mean Solar Date.	6 Ursæ Min. (B.)		Mean Solar Date.	*δ* Ursæ Min.		Mean Solar Date.	*λ* Ursæ Min.	
	Right Ascension.	Declination *North*.		Right Ascension.	Declination *North*.		Right Ascension.	Declination *North*.		Right Ascension.	Declination *North*.		Right Ascension.	Declination *North*.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Dec.	1 26	+88 49	Dec.	6 58	+87 11	Dec.	12 14	+88 11	Dec.	18 1	+86 36	Dec.	19 9	+89 0
	s	″		s	″		s	″		s	″		s	″
1.4	78.33	42.5	1.6	51.14	25.6	1.8	16.21	45.1	1.1	4.24	54.5	1.1	81.35	28.6
2.4	77.54	42.8	2.6	51.53	25.9	2.8	16.92	44.9	2.1	4.02	54.2	2.1	80.20	28.3
3.4	76.71	43.1	3.6	51.89	26.2	3.8	17.64	44.7	3.0	3.83	53.8	3.1	79.13	28.0
4.4	75.88	43.4	4.6	52.22	26.5	4.8	18.34	44.5	4.0	3.65	53.5	4.1	78.14	27.8
5.4	75.07	43.6	5.6	52.52	26.7	5.8	19.01	44.3	5.0	3.49	53.1	5.1	77.23	27.5
6.4	74.30	43.8	6.6	52.81	27.0	6.8	19.65	44.1	6.0	3.34	52.8	6.1	76.38	27.2
7.3	73.57	44.1	7.6	53.10	27.2	7.8	20.25	44.0	7.0	3.21	52.5	7.1	75.57	27.0
8.3	72.88	44.3	8.6	53.39	27.5	8.8	20.84	43.8	8.0	3.07	52.2	8.1	74.75	26.7
9.3	72.22	44.5	9.6	53.69	27.7	9.8	21.43	43.6	9.0	2.91	51.9	9.1	73.91	26.5
10.3	71.55	44.8	10.6	54.01	27.9	10.8	22.03	43.4	10.0	2.74	51.6	10.1	73.03	26.2
11.3	70.85	45.1	11.6	54.35	28.1	11.8	22.67	43.2	11.0	2.57	51.3	11.1	72.10	26.0
12.3	70.11	45.3	12.6	54.70	28.4	12.8	23.34	43.0	12.0	2.39	51.0	12.1	71.13	25.8
13.3	69.31	45.6	13.6	55.05	28.7	13.8	24.06	42.8	13.0	2.21	50.7	13.1	70.14	25.5
14.3	68.43	45.9	14.6	55.38	29.0	14.8	24.82	42.6	14.0	2.04	50.3	14.1	69.16	25.2
15.3	67.50	46.2	15.6	55.70	29.3	15.8	25.60	42.5	15.0	1.89	50.0	15.1	68.22	24.9
16.3	66.53	46.4	16.6	55.99	29.6	16.8	26.38	42.4	16.0	1.76	49.6	16.1	67.35	24.6
17.3	65.54	46.6	17.6	56.25	30.0	17.8	27.16	42.3	17.0	1.65	49.2	17.1	66.54	24.3
18.3	64.54	46.8	18.6	56.48	30.3	18.8	27.92	42.2	18.0	1.57	48.8	18.1	65.82	24.0
19.3	63.58	47.0	19.5	56.70	30.6	19.8	28.63	42.1	19.0	1.50	48.5	19.1	65.18	23.6
20.3	62.66	47.2	20.5	56.90	30.9	20.8	29.32	42.0	20.0	1.44	48.1	20.1	64.58	23.3
21.3	61.78	47.4	21.5	57.10	31.2	21.8	29.99	42.0	21.0	1.38	47.8	21.0	64.01	23.0
22.3	60.95	47.5	22.5	57.31	31.4	22.8	30.62	41.9	21.9	1.32	47.5	22.0	63.43	22.8
23.3	60.14	47.7	23.5	57.53	31.7	23.8	31.26	41.8	22.9	1.25	47.2	23.0	62.83	22.5
24.3	59.33	47.9	24.5	57.76	32.0	24.8	31.92	41.7	23.9	1.17	46.9	24.0	62.19	22.2
25.3	58.48	48.1	25.5	58.00	32.3	25.7	32.61	41.6	24.9	1.08	46.5	25.0	61.51	21.9
26.3	57.59	48.3	26.5	58.24	32.6	26.7	33.34	41.5	25.9	0.99	46.2	26.0	60.82	21.7
27.3	56.63	48.5	27.5	58.48	32.9	27.7	34.10	41.4	26.9	0.91	45.8	27.0	60.12	21.4
28.3	55.60	48.7	28.5	58.70	33.2	28.7	34.90	41.3	27.9	0.84	45.5	28.0	59.45	21.0
29.3	54.51	48.9	29.5	58.89	33.6	29.7	35.71	41.2	28.9	0.80	45.1	29.0	58.85	20.7
30.3	53.38	49.0	30.5	59.05	33.9	30.7	36.52	41.2	29.9	0.79	44.7	30.0	58.33	20.3
31.3	52.24	49.2	31.5	59.17	34.3	31.7	37.32	41.2	30.9	0.80	44.3	31.0	57.90	20.0
32.3	51.13	49.3	32.5	59.27	34.6	32.7	38.09	41.2	31.9	0.83	43.9	32.0	57.56	19.6

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	33 Piscium.				α Andromedæ.				β Cassiopeiæ.				22 Andromedæ.				γ Pegasi. (*Algenib.*)			
	Right Ascension.		Declination *South.*		Right Ascension.		Declination *North.*		Right Ascension.		Declination *North.*		Right Ascension.		Declination *North.*		Right Ascension.		Declination *North.*	
	h m 0 0		° ′ − 6 12		h m 0 3		° ′ +28 35		h m 0 4		° ′ +58 38		h m 0 5		° ′ +45 33		h m 0 8		° ′ +14 40	
	s		″		s		″		s		″		s		″		s		″	
Jan. 0.2	39.45	.10	70.1	0.5	39.62	.18	18.7	0.9	17.52	.32	62.3	0.8	33.93	.21	64.0	0.9	31.70	.12	36.8	0.8
10.2	39.35	.10	70.6	0.5	39.48	.14	17.8	1.2	17.20	.31	61.5	1.3	33.72	.20	63.1	1.3	31.58	.11	36.0	0.9
20.2	39.25	.08	71.1	0.3	39.34	.12	16.6	1.4	16.89	.28	60.2	1.7	33.52	.19	61.8	1.6	31.47	.10	35.1	1.0
30.2	39.17	.07	71.4	0.2	39.22	.10	15.2	1.5	16.61	.25	58.5	2.1	33.33	.16	60.2	1.9	31.37	.08	34.1	1.1
Feb. 9.1	39.10	.05	71.6	0.1	39.12	.08	13.7	1.6	16.36	.19	56.4	2.4	33.17	.12	58.3	2.2	31.29	.07	33.0	1.0
19.1	39.05	.02	71.5	0.2	39.04	.05	12.1	1.6	16.17	.14	54.0	2.6	33.05	.08	56.1	2.2	31.22	.04	32.0	0.9
Mar. 1.1	39.03	.01	71.3	0.4	38.99	.01	10.5	1.5	16.03	.07	51.4	2.7	32.97	.04	53.9	2.3	31.18	.00	31.1	0.8
11.0	39.04	.04	70.9	0.7	38.98	.04	9.0	1.4	15.96	.01	48.7	2.7	32.93	.02	51.6	2.2	31.18	.03	30.3	0.6
21.0	39.08	.08	70.2	0.9	39.02	.07	7.6	1.2	15.97	.09	46.0	2.6	32.95	.08	49.4	2.0	31.21	.07	29.7	0.4
31.0	39.16	.12	69.3	1.1	39.09	.13	6.4	0.9	16.06	.17	43.4	2.3	33.03	.14	47.4	1.8	31.28	.12	29.3	0.1
Apr. 10.0	39.28	.16	68.2	1.4	39.22	.17	5.5	0.6	16.23	.24	41.1	1.9	33.17	.19	45.6	1.4	31.40	.15	29.2	0.2
19.9	39.44	.19	66.8	1.6	39.39	.21	4.9	0.2	16.47	.31	39.2	1.6	33.36	.25	44.2	1.0	31.55	.20	29.4	0.5
29.9	39.63	.23	65.2	1.7	39.60	.25	4.7	0.2	16.78	.38	37.6	1.1	33.61	.30	43.2	0.6	31.75	.23	29.9	0.9
May 9.9	39.86	.27	63.5	2.0	39.85	.29	4.9	0.6	17.16	.43	36.5	0.6	33.91	.34	42.6	0.1	31.98	.27	30.8	1.1
19.9	40.13	.29	61.5	2.0	40.14	.32	5.5	1.0	17.59	.46	35.9	0.0	34.25	.37	42.5	0.4	32.25	.29	31.9	1.4
29.8	40.42	.30	59.5	2.1	40.46	.33	6.5	1.3	18.05	.49	35.9	0.5	34.62	.39	42.9	0.8	32.54	.31	33.3	1.7
June 8.8	40.72	.32	57.4	2.1	40.79	.35	7.8	1.7	18.54	.51	36.4	0.9	35.01	.40	43.7	1.3	32.85	.32	35.0	1.9
18.8	41.04	.32	55.3	2.0	41.14	.34	9.5	1.9	19.05	.50	37.3	1.5	35.41	.40	45.0	1.7	33.17	.32	36.9	2.0
28.7	41.36	.31	53.3	2.0	41.48	.33	11.4	2.2	19.55	.49	38.8	2.0	35.81	.39	46.7	2.1	33.49	.32	38.9	2.1
July 8.7	41.67	.30	51.3	1.8	41.81	.32	13.6	2.3	20.04	.46	40.8	2.3	36.20	.37	48.8	2.4	33.81	.30	41.0	2.2
18.7	41.97	.28	49.5	1.6	42.13	.30	15.9	2.5	20.50	.42	43.1	2.7	36.57	.34	51.2	2.7	34.11	.28	43.2	2.2
28.7	42.25	.25	47.9	1.4	42.43	.26	18.4	2.5	20.92	.37	45.8	3.0	36.91	.31	53.9	2.8	34.39	.26	45.4	2.1
Aug. 7.6	42.50	.22	46.5	1.1	42.69	.23	20.9	2.5	21.29	.32	48.8	3.1	37.22	.26	56.7	3.0	34.65	.22	47.5	2.1
17.6	42.72	.18	45.4	0.8	42.92	.19	23.4	2.5	21.61	.26	51.9	3.4	37.48	.22	59.7	3.0	34.87	.19	49.6	1.9
27.6	42.90	.15	44.6	0.6	43.11	.15	25.9	2.4	21.87	.20	55.3	3.4	37.70	.17	62.7	3.1	35.06	.15	51.5	1.7
Sept. 6.6	43.05	.10	44.0	0.3	43.26	.11	28.3	2.3	22.07	.14	58.7	3.4	37.87	.12	65.8	3.0	35.21	.11	53.2	1.5
16.5	43.15	.07	43.7	0.1	43.37	.07	30.6	2.1	22.21	.07	62.1	3.4	37.99	.07	68.8	2.9	35.32	.07	54.7	1.3
26.5	43.22	.03	43.6	0.2	43.44	.03	32.7	1.9	22.28	.01	65.5	3.3	38.06	.02	71.7	2.8	35.39	.04	56.0	1.1
Oct. 6.5	43.25	.00	43.8	0.4	43.47	.01	34.6	1.6	22.29	.05	68.8	3.0	38.08	.02	74.5	2.5	35.43	.01	57.1	0.9
16.5	43.25	.03	44.2	0.5	43.46	.03	36.2	1.4	22.24	.10	71.8	2.8	38.06	.06	77.0	2.3	35.44	.02	58.0	0.6
26.4	43.22	.05	44.7	0.6	43.43	.06	37.6	1.1	22.14	.15	74.6	2.5	38.00	.09	79.3	1.9	35.42	.05	58.6	0.4
Nov. 5.4	43.17	.07	45.3	0.7	43.37	.09	38.7	0.9	21.99	.20	77.1	2.1	37.91	.13	81.2	1.6	35.37	.07	59.0	0.2
15.4	43.10	.09	46.0	0.8	43.28	.11	39.6	0.5	21.79	.24	79.2	1.7	37.78	.15	82.8	1.2	35.30	.08	59.2	0.0
25.3	43.01	.10	46.8	0.7	43.17	.12	40.1	0.2	21.55	.27	80.9	1.2	37.63	.18	84.0	0.8	35.22	.10	59.2	0.2
Dec. 5.3	42.91	.10	47.5	0.8	43.05	.13	40.3	0.2	21.28	.30	82.1	0.7	37.45	.19	84.8	0.3	35.12	.11	59.0	0.4
15.3	42.81	.11	48.3	0.6	42.92	.13	40.1	0.4	20.98	.31	82.8	0.2	37.26	.20	85.1	0.1	35.01	.11	58.6	0.6
25.3	42.70	.10	48.9	0.6	42.79	.14	39.7	0.7	20.67	.32	83.0	0.4	37.06	.21	85.0	0.6	34.90	.11	58.0	0.7
35.2	42.60		49.5		42.65		39.0		20.35		82.6		36.85		84.4		34.79		57.3	

(CONSTANTS OF STRUVE AND PETERS.)

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	σ Andromedæ.				ι Ceti.				44 Piscium.				β Hydri.				12 Ceti.			
	Right Ascension.		Declination *North.*		Right Ascension.		Declination *South.*		Right Ascension.		Declination *North.*		Right Ascension.		Declination *South.*		Right Ascension.		Declination *South.*	
	h m 0 13		° ′ +36 16		h m 0 14		° ′ − 9 19		h m 0 20		° ′ + 1 25		h m 0 20		° ′ −77 45		h m 0 25		° ′ − 4 27	
	s		″		s		″		s		″		s		″		s		″	
Jan. 0.2	33.00	.16	54.9	0.9	46.36	.11	53.2	0.6	43.12	.11	61.2	0.7	57.84	0.87	87.1	1.1	22.61	.11	45.6	0.6
10.2	32.84	.16	54.0	1.1	46.25	.10	53.8	0.4	43.01	.10	60.5	0.6	56.97	0.81	86.0	1.6	22.50	.10	46.2	0.5
20.2	32.68	.15	52.9	1.5	46.15	.10	54.2	0.2	42.91	.10	59.9	0.6	56.16	0.73	84.4	2.2	22.40	.10	46.7	0.4
30.2	32.53	.13	51.4	1.7	46.05	.08	54.4	0.0	42.81	.08	59.3	0.5	55.43	0.62	82.2	2.7	22.30	.08	47.1	0.2
Feb. 9.1	32.40	.11	49.7	1.8	45.97	.06	54.4	0.2	42.73	.07	58.8	0.3	54.81	0.51	79.5	3.1	22.22	.07	47.3	0.1
19.1	32.29	.07	47.9	1.9	45.91	.03	54.2	0.4	42.66	.04	58.5	0.2	54.30	0.37	76.4	3.4	22.15	.05	47.4	0.1
Mar. 1.1	32.22	.03	46.0	1.8	45.88	.01	53.8	0.6	42.62	.01	58.3	0.1	53.93	0.23	73.0	3.6	22.10	.01	47.3	0.4
11.1	32.19	.02	44.2	1.8	45.87	.03	53.2	0.8	42.61	.02	58.2	0.2	53.70	0.08	69.4	3.8	22.09	.01	46.9	0.5
21.0	32.21	.07	42.4	1.6	45.90	.07	52.4	1.1	42.63	.06	58.4	0.5	53.62	0.08	65.6	3.9	22.10	.06	46.4	0.8
31.0	32.28	.12	40.8	1.3	45.97	.10	51.3	1.4	42.69	.10	58.9	0.7	53.70	0.23	61.7	3.8	22.16	.09	45.6	1.1
Apr. 10.0	32.40	.17	39.5	1.0	46.07	.15	49.9	1.5	42.79	.14	59.6	0.9	53.93	0.39	57.9	3.8	22.25	.13	44.5	1.3
19.9	32.57	.21	38.5	0.6	46.22	.18	48.4	1.8	42.93	.18	60.5	1.2	54.32	0.54	54.1	3.6	22.38	.18	43.2	1.5
29.9	32.78	.26	37.9	0.2	46.40	.22	46.6	1.9	43.11	.21	61.7	1.4	54.86	0.68	50.5	3.3	22.56	.21	41.7	1.7
May 9.9	33.04	.30	37.7	0.2	46.62	.26	44.7	2.0	43.32	.25	63.1	1.7	55.54	0.81	47.2	3.0	22.77	.25	40.0	1.8
19.9	33.34	.33	37.9	0.6	46.88	.28	42.7	2.1	43.57	.28	64.8	1.8	56.35	0.91	44.2	2.7	23.02	.27	38.2	2.0
29.8	33.67	.35	38.5	1.1	47.16	.30	40.6	2.2	43.85	.30	66.6	2.0	57.26	1.01	41.5	2.2	23.29	.30	36.2	2.1
June 8.8	34.02	.37	39.6	1.4	47.46	.32	38.4	2.1	44.15	.31	68.6	2.0	58.27	1.08	39.3	1.6	23.59	.31	34.1	2.1
18.8	34.39	.36	41.0	1.8	47.78	.32	36.3	2.1	44.46	.32	70.6	2.1	59.35	1.11	37.7	1.2	23.90	.32	32.0	2.1
28.8	34.75	.36	42.8	2.1	48.10	.32	34.2	1.9	44.78	.31	72.7	2.0	60.46	1.13	36.5	0.6	24.22	.32	29.9	2.0
July 8.7	35.11	.34	44.9	2.3	48.42	.30	32.3	1.8	45.09	.31	74.7	2.0	61.59	1.11	35.9	0.1	24.54	.30	27.9	1.9
18.7	35.45	.32	47.2	2.5	48.72	.29	30.5	1.5	45.40	.28	76.7	1.8	62.70	1.06	35.8	0.6	24.84	.29	26.0	1.7
28.7	35.77	.28	49.7	2.7	49.01	.26	29.0	1.3	45.68	.26	78.5	1.7	63.76	0.98	36.4	1.1	25.13	.27	24.3	1.5
Aug. 7.6	36.05	.25	52.4	2.7	49.27	.23	27.7	1.0	45.94	.23	80.2	1.5	64.74	0.87	37.5	1.6	25.40	.23	22.8	1.2
17.6	36.30	.21	55.1	2.7	49.50	.20	26.7	0.7	46.17	.20	81.7	1.3	65.61	0.74	39.1	2.1	25.63	.20	21.6	1.0
27.6	36.51	.17	57.8	2.7	49.70	.16	26.0	0.5	46.37	.16	83.0	1.0	66.35	0.58	41.2	2.4	25.83	.17	20.6	0.7
Sept. 6.6	36.68	.12	60.5	2.6	49.86	.12	25.5	0.1	46.53	.13	84.0	0.8	66.93	0.41	43.6	2.8	26.00	.13	19.9	0.4
16.5	36.80	.09	63.1	2.5	49.98	.08	25.4	0.1	46.66	.08	84.8	0.5	67.34	0.22	46.4	3.0	26.13	.09	19.5	0.2
26.5	36.89	.04	65.6	2.3	50.06	.05	25.5	0.4	46.74	.05	85.3	0.3	67.56	0.03	49.4	3.0	26.22	.06	19.3	0.0
Oct. 6.5	36.93	.00	67.9	2.1	50.11	.01	25.9	0.5	46.79	.02	85.6	0.0	67.59	0.16	52.4	3.0	26.28	.02	19.3	0.3
16.5	36.93	.04	70.0	1.8	50.12	.02	26.4	0.7	46.81	.01	85.6	0.1	67.43	0.33	55.4	2.8	26.30	.00	19.6	0.5
26.4	36.89	.06	71.8	1.6	50.10	.04	27.1	0.8	46.80	.03	85.5	0.2	67.10	0.50	58.2	2.6	26.30	.03	20.1	0.6
Nov. 5.4	36.83	.09	73.4	1.2	50.06	.07	27.9	0.9	46.77	.05	85.3	0.4	66.60	0.64	60.8	2.2	26.27	.06	20.7	0.7
15.4	36.74	.11	74.6	0.9	49.99	.08	28.8	0.9	46.72	.08	84.9	0.6	65.96	0.75	63.0	1.7	26.21	.07	21.4	0.7
25.3	36.63	.14	75.5	0.5	49.91	.09	29.7	0.9	46.64	.08	84.3	0.6	65.21	0.83	64.7	1.1	26.14	.09	22.1	0.7
Dec. 5.3	36.49	.15	76.0	0.2	49.82	.10	30.6	0.8	46.56	.10	83.7	0.6	64.38	0.88	65.8	0.6	26.05	.10	22.8	0.8
15.3	36.34	.15	76.2	0.2	49.72	.11	31.4	0.7	46.46	.10	83.1	0.7	63.50	0.90	66.4	0.1	25.95	.10	23.6	0.7
25.3	36.19	.17	76.0	0.6	49.61	.11	32.1	0.6	46.36	.11	82.4	0.6	62.60	0.89	66.3	0.7	25.85	.10	24.3	0.6
35.2	36.02		75.4		49.50		32.7		46.25		81.8		61.71		65.6		25.75		24.9	

FIXED STARS, 1909.

(CONSTANTS OF STRUVE AND PETERS.)

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	π Andromedæ.				α Cassiopeiæ.				β Ceti.				21 Cassiopeiæ.				ο Cassiopeiæ.			
	Right Ascension.		Declination North.		Right Ascension.		Declination North.		Right Ascension.		Declination South.		Right Ascension.		Declination North.		Right Ascension.		Declination North.	
	h m 0 31		° ′ +33 12		h m 0 35		° ′ +56 2		h m 0 38		° ′ −18 28		h m 0 39		° ′ +74 29		h m 0 39		° ′ +47 46	
	s		″		s		″		s		″		s		″		s		″	
Jan. 0.3	59.93	.15	70.1	0.7	19.01	.29	27.8	0.4	60.37	.12	83.5	0.5	35.98	.74	39.7	0.0	37.87	.23	79.1	0.5
10.2	59.78	.16	69.4	1.0	18.72	.29	27.4	0.9	60.25	.12	84.0	0.2	35.24	.72	39.7	0.6	37.64	.22	78.6	0.9
20.2	59.62	.15	68.4	1.2	18.43	.28	26.5	1.3	60.13	.12	84.2	0.1	34.52	.70	39.1	1.2	37.42	.22	77.7	1.3
30.2	59.47	.13	67.2	1.5	18.15	.25	25.2	1.8	60.01	.10	84.1	0.3	33.82	.64	37.9	1.7	37.20	.20	76.4	1.7
Feb. 9.1	59.34	.11	65.7	1.6	17.90	.22	23.4	2.1	59.91	.08	83.8	0.6	33.18	.55	36.2	2.2	37.00	.16	74.7	1.9
19.1	59.23	.09	64.1	1.7	17.68	.16	21.3	2.4	59.83	.06	83.2	0.9	32.63	.44	34.0	2.5	36.84	.14	72.8	2.1
Mar. 1.1	59.14	.04	62.4	1.6	17.52	.11	18.9	2.5	59.77	.03	82.3	1.1	32.19	.31	31.5	2.8	36.70	.08	70.7	2.2
11.1	59.10	.00	60.8	1.6	17.41	.04	16.4	2.5	59.74	.00	81.2	1.4	31.88	.16	28.7	2.9	36.62	.03	68.5	2.2
21.0	59.10	.04	59.2	1.4	17.37	.03	13.9	2.4	59.74	.04	79.8	1.6	31.72	.01	25.8	3.0	36.59	.03	66.3	2.2
31.0	59.14	.10	57.8	1.2	17.40	.11	11.5	2.3	59.78	.08	78.2	1.9	31.71	.14	22.8	2.9	36.62	.10	64.1	1.9
Apr. 10.0	59.24	.14	56.6	0.9	17.51	.18	9.2	2.0	59.86	.12	76.3	2.0	31.85	.30	19.9	2.6	36.72	.16	62.2	1.6
20.0	59.38	.20	55.7	0.5	17.69	.26	7.2	1.6	59.98	.17	74.3	2.2	32.15	.44	17.3	2.3	36.88	.22	60.6	1.3
29.9	59.58	.24	55.2	0.2	17.95	.32	5.6	1.2	60.15	.20	72.1	2.3	32.59	.57	15.0	1.9	37.10	.27	59.3	0.9
May 9.9	59.82	.28	55.0	0.2	18.27	.37	4.4	0.8	60.35	.24	69.8	2.4	33.16	.68	13.1	1.5	37.37	.32	58.4	0.5
19.9	60.10	.31	55.2	0.6	18.64	.42	3.6	0.3	60.59	.27	67.4	2.4	33.84	.77	11.6	0.9	37.69	.36	57.9	0.0
29.8	60.41	.33	55.8	1.0	19.06	.46	3.3	0.2	60.86	.30	65.0	2.4	34.61	.83	10.7	0.4	38.05	.39	57.9	0.5
June 8.8	60.74	.36	56.8	1.4	19.52	.47	3.5	0.7	61.16	.32	62.6	2.3	35.44	.87	10.3	0.2	38.44	.41	58.4	0.9
18.8	61.10	.36	58.2	1.7	19.99	.48	4.2	1.2	61.48	.33	60.3	2.2	36.31	.89	10.5	0.7	38.85	.42	59.3	1.3
28.8	61.46	.35	59.9	2.0	20.47	.48	5.4	1.7	61.81	.33	58.1	1.9	37.20	.87	11.2	1.2	39.27	.42	60.6	1.7
July 8.7	61.81	.34	61.9	2.2	20.95	.46	7.1	2.0	62.14	.32	56.2	1.6	38.07	.85	12.4	1.7	39.69	.40	62.3	2.1
18.7	62.15	.32	64.1	2.3	21.41	.43	9.1	2.4	62.46	.31	54.6	1.4	38.92	.80	14.1	2.2	40.09	.38	64.4	2.4
28.7	62.47	.29	66.4	2.5	21.84	.39	11.5	2.7	62.77	.28	53.2	1.1	39.72	.73	16.3	2.6	40.47	.35	66.8	2.6
Aug. 7.7	62.76	.27	68.9	2.6	22.23	.35	14.2	3.0	63.05	.26	52.1	0.7	40.45	.65	18.9	2.9	40.82	.31	69.4	2.8
17.6	63.03	.22	71.5	2.6	22.58	.30	17.2	3.1	63.31	.22	51.4	0.3	41.10	.56	21.8	3.3	41.13	.27	72.2	2.9
27.6	63.25	.19	74.1	2.5	22.88	.25	20.3	3.2	63.53	.19	51.1	0.0	41.66	.45	25.1	3.4	41.40	.22	75.1	3.0
Sept. 6.6	63.44	.14	76.6	2.4	23.13	.19	23.5	3.3	63.72	.14	51.1	0.4	42.11	.34	28.5	3.6	41.62	.18	78.1	3.0
16.5	63.58	.10	79.0	2.4	23.32	.13	26.8	3.2	63.86	.11	51.5	0.6	42.45	.22	32.1	3.7	41.80	.12	81.1	3.0
26.5	63.68	.07	81.4	2.1	23.45	.07	30.0	3.2	63.97	.07	52.1	0.9	42.67	.11	35.8	3.7	41.92	.08	84.1	2.8
Oct. 6.5	63.75	.03	83.5	1.9	23.52	.02	33.2	3.1	64.04	.04	53.0	1.1	42.78	.01	39.5	3.7	42.00	.03	86.9	2.7
16.5	63.78	.01	85.4	1.8	23.54	.04	36.3	2.8	64.08	.00	54.1	1.2	42.77	.13	43.2	3.5	42.03	.01	89.6	2.5
26.4	63.77	.04	87.2	1.4	23.50	.08	39.1	2.6	64.08	.03	55.3	1.4	42.64	.25	46.7	3.3	42.02	.05	92.1	2.2
Nov. 5.4	63.73	.06	88.6	1.2	23.42	.13	41.7	2.2	64.05	.05	56.7	1.3	42.39	.35	50.0	2.9	41.97	.09	94.3	1.9
15.4	63.67	.09	89.8	0.9	23.29	.17	43.9	1.9	64.00	.08	58.0	1.2	42.04	.46	52.9	2.6	41.88	.12	96.2	1.6
25.4	63.58	.11	90.7	0.5	23.12	.21	45.8	1.4	63.92	.09	59.2	1.2	41.58	.54	55.5	2.1	41.76	.16	97.8	1.2
Dec. 5.3	63.47	.13	91.2	0.2	22.91	.25	47.2	1.0	63.83	.10	60.4	1.0	41.04	.62	57.6	1.6	41.60	.18	99.0	0.7
15.3	63.34	.15	91.4	0.1	22.66	.27	48.2	0.5	63.73	.11	61.4	0.8	40.42	.68	59.2	1.0	41.42	.20	99.7	0.3
25.3	63.19	.15	91.3	0.5	22.39	.28	48.7	0.1	63.62	.12	62.2	0.6	39.74	.72	60.2	0.4	41.22	.22	100.0	0.2
35.3	63.04		90.8		22.11		48.6		63.50		62.8		39.02		60.6		41.00		99.8	

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	δ Piscium.				γ Cassiopeiæ.				μ Andromedæ.				43 Cephei (H.).				ε Piscium.			
	Right Ascension.		Declination *North.*		Right Ascension.		Declination *North.*		Right Ascension.		Declination *North.*		Right Ascension.		Declination *North.*		Right Ascension.		Declination *North.*	
	h m		° '		h m		° '		h m		° '		h m		° '		h m		° '	
	0 43		+ 7 5		0 51		+60 13		0 51		+38 0		0 55		+85 45		0 58		+ 7 23	
	s		"		s		"		s		"		s		"		s		"	
Jan. 0.3	56.60	.11	18.6	0.7	11.40	.34	37.5	0.1	40.89	.17	26.3	0.5	67.39	2.91	83.6	0.5	12.23	.11	56.2	0.6
10.2	56.49	.12	17.9	0.7	11.06	.35	37.4	0.7	40.72	.18	25.8	0.8	64.48	2.93	84.1	0.1	12.12	.12	55.6	0.7
20.2	56.37	.11	17.2	0.7	10.71	.33	36.7	1.2	40.54	.17	25.0	1.1	61.55	2.84	84.0	0.8	12.00	.12	54.9	0.7
30.2	56.26	.10	16.5	0.6	10.38	.31	35.5	1.6	40.37	.16	23.9	1.4	58.71	2.63	83.2	1.4	11.88	.11	54.2	0.6
Feb. 9.2	56.16	.09	15.9	0.6	10.07	.27	33.9	2.0	40.21	.14	22.5	1.6	56.08	2.32	81.8	1.9	11.77	.09	53.6	0.6
19.1	56.07	.06	15.3	0.5	9.80	.22	31.9	2.3	40.07	.11	20.9	1.8	53.76	1.94	79.9	2.4	11.68	.08	53.0	0.4
Mar. 1.1	56.01	.04	14.8	0.3	9.58	.16	29.6	2.5	39.96	.08	19.1	1.8	51.82	1.46	77.5	2.7	11.60	.05	52.6	0.3
11.1	55.97	.00	14.5	0.1	9.42	.08	27.1	2.5	39.88	.02	17.3	1.8	50.36	0.95	74.8	2.9	11.55	.01	52.3	0.2
21.0	55.97	.04	14.4	0.1	9.34	.00	24.6	2.6	39.86	.02	15.5	1.6	49.41	0.39	71.9	3.1	11.54	.02	52.1	0.1
31.0	56.01	.07	14.5	0.3	9.34	.08	22.0	2.5	39.88	.07	13.9	1.4	49.02	0.17	68.8	3.1	11.56	.06	52.2	0.3
Apr. 10.0	56.08	.12	14.8	0.6	9.42	.17	19.5	2.2	39.95	.13	12.5	1.2	49.19	0.71	65.7	2.9	11.62	.10	52.5	0.6
20.0	56.20	.16	15.4	0.9	9.59	.25	17.3	1.9	40.08	.18	11.3	0.9	49.90	1.24	2.8	2.6	11.72	.15	53.1	0.8
29.9	56.36	.20	16.3	1.1	9.84	.33	15.4	1.5	40.26	.23	10.4	0.5	51.14	1.70	60.2	2.4	11.87	.19	53.9	1.1
May 9.9	56.56	.24	17.4	1.4	10.17	.39	13.9	1.0	40.49	.28	9.9	0.1	52.84	2.10	57.8	1.9	12.06	.22	55.0	1.3
19.9	56.80	.27	18.8	1.6	10.56	.45	12.9	0.6	40.77	.32	9.8	0.2	54.94	2.43	55.9	1.4	12.28	.26	56.3	1.5
29.9	57.07	.29	20.4	1.8	11.01	.49	12.3	0.1	41.09	.34	10.0	0.7	57.37	2.68	54.5	0.9	12.54	.29	57.8	1.8
June 8.8	57.36	.31	22.2	1.9	11.50	.52	12.2	0.4	41.43	.36	10.7	1.1	60.05	2.85	53.6	0.4	12.83	.30	59.6	1.9
18.8	57.67	.32	24.1	2.0	12.02	.53	12.6	0.9	41.79	.38	11.8	1.5	62.90	2.94	53.2	0.2	13.13	.32	61.5	2.0
28.8	57.99	.32	26.1	2.0	12.55	.53	13.5	1.4	42.17	.37	13.3	1.7	65.84	2.95	53.4	0.8	13.45	.32	63.5	2.0
July 8.7	58.31	.31	28.1	2.0	13.08	.51	14.9	1.8	42.54	.36	15.0	2.1	68.79	2.88	54.2	1.3	13.77	.31	65.5	2.0
18.7	58.62	.29	30.1	2.0	13.59	.49	16.7	2.2	42.90	.35	17.1	2.3	71.67	2.75	55.5	1.8	14.08	.30	67.5	1.9
28.7	58.91	.28	32.1	1.9	14.08	.45	18.9	2.6	43.25	.32	19.4	2.4	74.42	2.57	57.3	2.2	14.38	.28	69.4	1.9
Aug. 7.7	59.19	.24	34.0	1.7	14.53	.41	21.5	2.8	43.57	.29	21.8	2.5	76.99	2.31	59.5	2.7	14.66	.26	71.3	1.7
17.6	59.43	.22	35.7	1.5	14.94	.36	24.3	3.1	43.86	.26	24.3	2.7	79.30	2.02	62.2	3.1	14.92	.22	73.0	1.6
27.6	59.65	.18	37.2	1.3	15.30	.29	27.4	3.2	44.12	.21	27.0	2.6	81.32	1.68	65.3	3.3	15.14	.20	74.6	1.3
Sept. 6.6	59.83	.15	38.5	1.1	15.59	.24	30.6	3.3	44.33	.18	29.6	2.6	83.00	1.31	68.6	3.6	15.34	.16	75.9	1.1
16.5	59.98	.11	39.6	0.8	15.83	.18	33.9	3.4	44.51	.13	32.2	2.5	84.31	0.91	72.2	3.8	15.50	.12	77.0	0.8
26.5	60.09	.07	40.4	0.7	16.01	.11	37.3	3.3	44.64	.10	34.7	2.4	85.22	0.49	76.0	3.8	15.62	.09	77.8	0.7
Oct. 6.5	60.16	.05	41.1	0.4	16.12	.05	40.6	3.2	44.74	.05	37.1	2.2	85.71	0.05	79.8	3.8	15.71	.06	78.5	0.4
16.5	60.21	.01	41.5	0.2	16.17	.02	43.8	3.0	44.79	.02	39.3	2.0	85.76	0.41	83.6	3.8	15.77	.03	78.9	0.2
26.5	60.22	.01	41.7	0.0	16.15	.07	46.8	2.8	44.81	.02	41.3	1.8	85.35	0.86	87.4	3.6	15.80	.00	79.1	0.1
Nov. 5.4	60.21	.04	41.7	0.1	16.08	.13	49.6	2.6	44.79	.06	43.1	1.5	84.49	1.29	91.0	3.4	15.80	.03	79.2	0.1
15.4	60.17	.06	41.6	0.3	15.95	.18	52.2	2.2	44.73	.08	44.6	1.2	83.20	1.71	94.4	3.1	15.77	.04	79.1	0.3
25.4	60.11	.07	41.3	0.4	15.77	.23	54.4	1.7	44.65	.10	45.8	0.8	81.49	2.08	97.5	2.6	15.73	.07	78.8	0.4
Dec. 5.3	60.04	.09	40.9	0.5	15.54	.27	56.1	1.2	44.55	.13	46.6	0.5	79.41	2.41	100.1	2.1	15.66	.08	78.4	0.5
15.3	59.95	.10	40.4	0.6	15.27	.30	57.3	0.8	44.42	.15	47.1	0.1	77.00	2.67	102.2	1.5	15.58	.10	77.9	0.5
25.3	59.85	.11	39.8	0.6	14.97	.32	58.1	0.2	44.27	.17	47.2	0.2	74.33	2.85	103.7	1.0	15.48	.11	77.4	0.6
35.3	59.74		39.2		14.65		58.3		44.10		47.0		71.48		104.7		15.37		76.8	

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	β Andromedæ.				κ Tucanæ.				*f* Piscium.				θ¹ Ceti.				38 Cassiopeiæ.			
	Right Ascension.		Declination *North*.		Right Ascension.		Declination *South*.		Right Ascension.		Declination *North*.		Right Ascension.		Declination *South*.		Right Ascension.		Declination *North*.	
	h m 1 4		° ′ +35 8		h m 1 12		° ′ −69 21		h m 1 13		° ′ + 3 7		h m 1 19		° ′ − 8 38		h m 1 24		° ′ +69 47	
	s		″		s		″		s		″		s		″		s		″	
Jan. 0.3	37.04	.16	22.0	0.4	41.00	.53	59.9	0.2	5.43	.11	61.1	0.6	27.72	.12	80.3	0.7	25.81	.51	60.1	0.5
10.2	36.88	.17	21.6	0.7	40.47	.52	59.7	0.7	5.32	.12	60.5	0.6	27.60	.12	81.0	0.5	25.30	.54	60.6	0.0
20.2	36.71	.17	20.9	1.0	39.95	.50	59.0	1.3	5.20	.12	59.9	0.6	27.48	.12	81.5	0.3	24.76	.54	60.6	0.6
30.2	36.54	.16	19.9	1.3	39.45	.47	57.7	1.9	5.08	.11	59.3	0.5	27.36	.12	81.8	0.2	24.22	.52	60.0	1.2
Feb. 9.2	36.38	.14	18.6	1.4	38.98	.41	55.8	2.4	4.97	.11	58.8	0.4	27.24	.11	82.0	0.1	23.70	.48	58.8	1.7
19.1	36.24	.11	17.2	1.6	38.57	.35	53.4	2.8	4.86	.08	58.4	0.2	27.13	.09	81.9	0.3	23.22	.41	57.1	2.1
Mar. 1.1	36.13	.08	15.6	1.6	38.22	.28	50.6	3.1	4.78	.07	58.2	0.1	27.04	.07	81.6	0.6	22.81	.33	55.0	2.4
11.1	36.05	.04	14.0	1.6	37.94	.19	47.5	3.5	4.71	.03	58.1	0.2	26.97	.04	81.0	0.8	22.48	.22	52.6	2.7
21.0	36.01	.00	12.4	1.5	37.75	.10	44.0	3.6	4.68	.01	58.3	0.3	26.93	.00	80.2	1.0	22.26	.11	49.9	2.7
31.0	36.01	.06	10.9	1.3	37.65	.01	40.4	3.8	4.69	.05	58.6	0.5	26.93	.04	79.2	1.2	22.15	.01	47.2	2.8
Apr. 10.0	36.07	.11	9.6	1.1	37.64	.09	36.6	3.8	4.74	.09	59.1	0.8	26.97	.08	78.0	1.5	22.16	.14	44.4	2.6
20.0	36.18	.17	8.5	0.8	37.73	.20	32.8	3.8	4.83	.13	59.9	1.1	27.05	.12	76.5	1.7	22.30	.25	41.8	2.4
29.9	36.35	.21	7.7	0.4	37.93	.29	29.0	3.6	4.96	.17	61.0	1.3	27.17	.17	74.8	1.9	22.55	.36	39.4	2.1
May 9.9	36.56	.26	7.3	0.0	38.22	.38	25.4	3.5	5.13	.21	62.3	1.5	27.34	.21	72.9	2.1	22.91	.47	37.3	1.7
19.9	36.82	.30	7.3	0.3	38.60	.47	21.9	3.2	5.34	.25	63.8	1.7	27.55	.24	70.8	2.1	23.38	.56	35.6	1.2
29.9	37.12	.33	7.6	0.7	39.07	.55	18.7	2.9	5.59	.28	65.5	1.8	27.79	.27	68.7	2.2	23.94	.62	34.4	0.8
June 8.8	37.45	.35	8.3	1.0	39.62	.61	15.8	2.4	5.87	.30	67.3	2.0	28.06	.29	66.5	2.2	24.56	.68	33.6	0.3
18.8	37.80	.36	9.3	1.4	40.23	.65	13.4	2.0	6.17	.31	69.3	2.0	28.35	.31	64.3	2.2	25.24	.71	33.3	0.3
28.8	38.16	.37	10.7	1.7	40.88	.69	11.4	1.4	6.48	.31	71.3	2.0	28.66	.32	62.1	2.1	25.95	.73	33.6	0.7
July 8.8	38.53	.36	12.4	2.0	41.57	.70	10.0	0.9	6.79	.32	73.3	2.0	28.98	.31	60.0	1.9	26.68	.72	34.3	1.2
18.7	38.89	.34	14.4	2.1	42.27	.68	9.1	0.4	7.11	.30	75.3	1.9	29.29	.31	58.1	1.7	27.40	.70	35.5	1.7
28.7	39.23	.32	16.5	2.3	42.95	.66	8.7	0.3	7.41	.29	77.2	1.7	29.60	.29	56.4	1.5	28.10	.67	37.2	2.1
Aug. 7.7	39.55	.30	18.8	2.4	43.61	.62	9.0	0.8	7.70	.26	78.9	1.6	29.89	.27	54.9	1.2	28.77	.62	39.3	2.5
17.6	39.85	.26	21.2	2.5	44.23	.55	9.8	1.4	7.96	.24	80.5	1.3	30.16	.24	53.7	0.8	29.39	.55	41.8	2.9
27.6	40.11	.22	23.7	2.5	44.78	.47	11.2	1.9	8.20	.20	81.8	1.1	30.40	.21	52.9	0.6	29.94	.49	44.7	3.1
Sept. 6.6	40.33	.19	26.2	2.4	45.25	.37	13.1	2.3	8.40	.17	82.9	0.9	30.61	.18	52.3	0.2	30.43	.41	47.8	3.3
16.6	40.52	.15	28.6	2.4	45.62	.28	15.4	2.7	8.57	.14	83.8	0.6	30.79	.15	52.1	0.0	30.84	.33	51.1	3.4
26.5	40.67	.11	31.0	2.2	45.90	.16	18.1	2.9	8.71	.11	84.4	0.4	30.94	.11	52.1	0.3	31.17	.24	54.5	3.5
Oct. 6.5	40.78	.07	33.2	2.0	46.06	.06	21.0	3.0	8.82	.07	84.8	0.1	31.05	.08	52.4	0.6	31.41	.15	58.0	3.5
16.5	40.85	.03	35.2	1.9	46.12	.06	24.0	3.0	8.89	.04	84.9	0.0	31.13	.04	53.0	0.8	31.56	.06	61.5	3.4
26.5	40.88	.00	37.1	1.6	46.06	.16	27.0	2.9	8.93	.02	84.9	0.2	31.17	.01	53.8	0.9	31.62	.03	64.9	3.3
Nov. 5.4	40.88	.03	38.7	1.4	45.90	.25	29.9	2.7	8.95	.01	84.7	0.4	31.18	.01	54.7	1.0	31.59	.12	68.2	3.1
15.4	40.85	.06	40.1	1.1	45.65	.34	32.6	2.3	8.94	.04	84.3	0.5	31.17	.03	55.7	1.0	31.47	.21	71.3	2.7
25.4	40.79	.09	41.2	0.8	45.31	.41	34.9	1.9	8.90	.06	83.8	0.5	31.14	.06	56.7	1.0	31.26	.30	74.0	2.4
Dec. 5.3	40.70	.12	42.0	0.5	44.90	.47	36.8	1.4	8.84	.07	83.3	0.6	31.08	.08	57.7	1.0	30.96	.37	76.4	2.0
15.3	40.58	.13	42.5	0.1	44.43	.50	38.2	0.8	8.77	.09	82.7	0.7	31.00	.09	58.7	0.9	30.59	.43	78.4	1.4
25.3	40.45	.15	42.6	0.2	43.93	.53	39.0	0.2	8.68	.11	82.0	0.6	30.91	.11	59.6	0.7	30.16	.49	79.8	0.9
35.3	40.30		42.4		43.40		39.2		8.57		81.4		30.80		60.3		29.67		80.7	

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	η Piscium.				υ Andromedæ.				π Piscium.				α Eridani. (*Achernar.*)				ν Piscium.			
	Right Ascension.		Declination *North.*		Right Ascension.		Declination *North.*		Right Ascension.		Declination *North.*		Right Ascension.		Declination *South.*		Right Ascension.		Declination *North.*	
	h m I 26		° ′ +14 52		h m I 31		° ′ +40 56		h m I 32		° ′ +11 40		h m I 34		° ′ −57 41		h m I 36		° ′ + 5 I	
	s		″		s		″		s		″		s		″		s		″	
Jan. 0.3	35.92	.11	34.8	0.5	26.31	.18	68.1	0.1	15.61	.12	31.2	0.5	19.49	.32	79.7	0.3	40.97	.11	33.1	0.6
10.3	35.81	.13	34.3	0.7	26.13	.19	68.0	0.4	15.49	.12	30.7	0.6	19.17	.32	80.0	0.2	40.86	.12	32.5	0.6
20.2	35.68	.13	33.6	0.7	25.94	.20	67.6	0.8	15.37	.13	30.1	0.7	18.85	.32	79.8	0.7	40.74	.12	31.9	0.6
30.2	35.55	.13	32.9	0.7	25.74	.19	66.8	1.1	15.24	.13	29.4	0.6	18.53	.30	79.1	1.3	40.62	.13	31.3	0.5
Feb. 9.2	35.42	.12	32.2	0.8	25.55	.18	65.7	1.4	15.11	.12	28.8	0.6	18.23	.28	77.8	1.8	40.49	.12	30.8	0.4
19.2	35.30	.10	31.4	0.7	25.37	.16	64.3	1.6	14.99	.10	28.2	0.6	17.95	.25	76.0	2.2	40.37	.10	30.4	0.3
Mar. 1.1	35.20	.08	30.7	0.6	25.21	.12	62.7	1.7	14.89	.08	27.6	0.5	17.70	.20	73.8	2.7	40.27	.08	30.1	0.2
11.1	35.12	.04	30.1	0.5	25.09	.08	61.0	1.7	14.81	.05	27.1	0.3	17.50	.15	71.1	3.0	40.19	.06	29.9	0.1
21.1	35.08	.01	29.6	0.4	25.01	.03	59.3	1.7	14.76	.01	26.8	0.2	17.35	.09	68.1	3.3	40.13	.01	30.0	0.2
31.1	35.07	.03	29.2	0.1	24.98	.03	57.6	1.6	14.75	.03	26.6	0.0	17.26	.03	64.8	3.4	40.12	.02	30.2	0.4
Apr. 10.0	35.10	.08	29.1	0.1	25.01	.08	56.0	1.5	14.78	.07	26.6	0.3	17.23	.04	61.4	3.6	40.14	.07	30.6	0.7
20.0	35.18	.13	29.2	0.3	25.09	.14	54.5	1.1	14.85	.12	26.9	0.5	17.27	.12	57.8	3.7	40.21	.11	31.3	0.9
30.0	35.31	.17	29.5	0.6	25.23	.20	53.4	0.9	14.97	.16	27.4	0.8	17.39	.18	54.1	3.6	40.32	.15	32.2	1.1
May 9.9	35.48	.21	30.1	0.9	25.43	.25	52.5	0.5	15.13	.20	28.2	1.0	17.57	.25	50.5	3.5	40.47	.20	33.3	1.4
19.9	35.69	.25	31.0	1.1	25.68	.30	52.0	0.2	15.33	.24	29.2	1.3	17.82	.31	47.0	3.4	40.67	.23	34.7	1.6
29.9	35.94	.27	32.1	1.4	25.98	.33	51.8	0.3	15.57	.27	30.5	1.5	18.13	.37	43.6	3.1	40.90	.26	36.3	1.7
June 8.9	36.21	.30	33.5	1.6	26.31	.36	52.1	0.6	15.84	.30	32.0	1.6	18.50	.42	40.5	2.7	41.16	.29	38.0	1.9
18.8	36.51	.32	35.1	1.7	26.67	.37	52.7	1.0	16.14	.31	33.6	1.8	18.92	.45	37.8	2.4	41.45	.31	39.9	1.9
28.8	36.83	.32	36.8	1.9	27.04	.39	53.7	1.4	16.45	.32	35.4	1.9	19.37	.47	35.4	1.9	41.76	.31	41.8	2.0
July 8.8	37.15	.33	38.7	1.9	27.43	.39	55.1	1.6	16.77	.32	37.3	2.0	19.84	.49	33.5	1.4	42.07	.31	43.8	1.9
18.7	37.48	.31	40.6	2.0	27.82	.38	56.7	1.9	17.09	.31	39.3	1.9	20.33	.49	32.1	0.8	42.38	.31	45.7	1.9
28.7	37.79	.30	42.6	1.9	28.20	.35	58.6	2.2	17.40	.30	41.2	1.9	20.82	.47	31.3	0.3	42.69	.30	47.6	1.8
Aug. 7.7	38.09	.27	44.5	1.9	28.55	.34	60.8	2.3	17.70	.27	43.1	1.8	21.29	.44	31.0	0.3	42.99	.28	49.4	1.6
17.7	38.36	.25	46.4	1.8	28.89	.30	63.1	2.4	17.97	.25	44.9	1.6	21.73	.41	31.3	0.8	43.27	.25	51.0	1.4
27.6	38.61	.22	48.2	1.6	29.19	.27	65.5	2.5	18.22	.23	46.5	1.5	22.14	.36	32.1	1.4	43.52	.22	52.4	1.2
Sept. 6.6	38.83	.19	49.8	1.4	29.46	.23	68.0	2.5	18.45	.19	48.0	1.2	22.50	.30	33.5	1.9	43.74	.19	53.6	0.9
16.6	39.02	.16	51.2	1.3	29.69	.19	70.5	2.5	18.64	.16	49.2	1.1	22.80	.23	35.4	2.2	43.93	.16	54.5	0.7
26.6	39.18	.12	52.5	1.0	29.88	.15	73.0	2.4	18.80	.13	50.3	0.9	23.03	.17	37.6	2.6	44.09	.13	55.2	0.5
Oct. 6.5	39.30	.09	53.5	0.9	30.03	.11	75.4	2.3	18.93	.09	51.2	0.6	23.20	.10	40.2	2.8	44.22	.10	55.7	0.2
16.5	39.39	.06	54.4	0.6	30.14	.07	77.7	2.2	19.02	.06	51.8	0.5	23.30	.02	43.0	2.8	44.32	.07	55.9	0.0
26.5	39.45	.03	55.0	0.5	30.21	.03	79.9	2.0	19.08	.04	52.3	0.3	23.32	.04	45.8	2.9	44.39	.03	55.9	0.1
Nov. 5.4	39.48	.00	55.5	0.3	30.24	.01	81.9	1.7	19.12	.01	52.6	0.1	23.28	.10	48.7	2.7	44.42	.01	55.8	0.2
15.4	39.48	.02	55.8	0.1	30.23	.04	83.6	1.5	19.13	.02	5-.7	0.1	23.18	.16	51.4	2.5	44.43	.01	55.6	0.4
25.4	39.46	.05	55.9	0.0	30.19	.08	85.1	1.2	19.11	.05	5-.6	0.2	23.02	.22	53.9	2.2	44.42	.04	55.2	0.5
Dec. 5.4	39.41	.07	55.9	0.2	30.11	.11	86.3	0.9	19.06	.06	52.4	0.3	22.80	.25	56.1	1.7	44.38	.06	54.7	0.6
15.3	39.34	.09	55.7	0.3	30.00	.13	87.2	0.5	19.00	.09	52.1	0.4	22.55	.28	57.8	1.3	44.32	.08	54.1	0.6
25.3	39.25	.11	55.4	0.5	29.87	.16	87.7	0.2	18.91	.10	51.7	0.5	22.27	.31	59.1	0.7	44.24	.10	53.5	0.6
35.3	39.14		54.9		29.71		87.9		18.81		51.2		21.96		59.8		44.14		52.9	

FIXED STARS, 1909.

(CONSTANTS OF STRUVE AND PETERS.)

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	ο Piscium.				ζ Ceti.				β Arietis.				50 Cassiopeiæ.				γ Andromedæ.			
	Right Ascension.		Declination *North.*		Right Ascension.		Declination *South.*		Right Ascension.		Declination *North.*		Right Ascension.		Declination *North.*		Right Ascension.		Declination *North.*	
	h m 1 40		° ′ + 8 41		h m 1 46		° ′ −10 46		h m 1 49		° ′ +20 21		h m 1 55		° ′ +71 58		h m 1 58		° ′ +41 53	
	s		″		s		″		s		″		s		″		s		″	
Jan. 0.3	34.52	.11	55.7	0.6	57.54	.12	74.2	0.7	35.94	.12	48.3	0.4	38.31	.56	65.2	1.0	17.90	.17	42.6	0.2
10.3	34.41	.12	55.1	0.6	57.42	.12	74.9	0.6	35.82	.13	47.9	0.5	37.75	.60	66.2	0.4	17.73	.19	42.8	0.2
20.3	34.29	.13	54.5	0.5	57.30	.13	75.5	0.4	35.69	.14	47.4	0.6	37.15	.62	66.6	0.1	17.54	.20	42.6	0.5
30.3	34.16	.13	54.0	0.6	57.17	.14	75.9	0.1	35.55	.15	46.8	0.8	36.53	.61	66.5	0.8	17.34	.21	42.1	0.9
Feb. 9.2	34.03	.12	53.4	0.5	57.03	.12	76.0	0.1	35.40	.13	46.0	0.8	35.92	.58	65.7	1.3	17.13	.20	41.2	1.1
19.2	33.91	.11	52.9	0.5	56.91	.12	75.9	0.4	35.27	.13	45.2	0.8	35.34	.52	64.4	1.8	16.93	.18	40.1	1.4
Mar. 1.1	33.80	.08	52.4	0.3	56.79	.09	75.5	0.6	35.14	.10	44.4	0.8	34.82	.44	62.6	2.1	16.75	.15	38.7	1.6
11.1	33.72	.06	52.1	0.2	56.70	.06	74.9	0.9	35.04	.07	43.6	0.8	34.38	.34	60.5	2.5	16.60	.11	37.1	1.6
21.1	33.66	.02	51.9	0.0	56.64	.03	74.0	1.1	34.97	.03	42.8	0.6	34.04	.22	58.0	2.6	16.49	.06	35.5	1.7
31.1	33.64	.02	51.9	0.2	56.61	.01	72.9	1.3	34.94	.01	42.2	0.5	33.82	.08	55.4	2.8	16.43	.01	33.8	1.6
Apr. 10.0	33.66	.06	52.1	0.5	56.62	.05	71.6	1.6	34.95	.06	41.7	0.3	33.74	.05	52.6	2.7	16.42	.06	32.2	1.5
20.0	33.72	.11	52.6	0.7	56.67	.09	70.0	1.8	35.01	.10	41.4	0.0	33.79	.19	49.9	2.5	16.48	.11	30.7	1.2
30.0	33.83	.15	53.3	0.9	56.76	.14	68.2	2.0	35.11	.15	41.4	0.2	33.98	.32	47.4	2.4	16.59	.17	29.5	1.0
May 9.9	33.98	.20	54.2	1.2	56.90	.18	66.2	2.1	35.26	.20	41.6	0.5	34.30	.44	45.0	2.0	16.76	.22	28.5	0.7
19.9	34.18	.23	55.4	1.4	57.08	.22	64.1	2.3	35.46	.24	42.1	0.8	34.74	.55	43.0	1.6	16.98	.28	27.8	0.4
29.9	34.41	.26	56.8	1.6	57.30	.26	61.8	2.3	35.70	.27	42.9	1.0	35.29	.64	41.4	1.2	17.26	.32	27.4	0.0
June 8.9	34.67	.29	58.4	1.7	57.56	.28	59.5	2.3	35.97	.30	43.9	1.3	35.93	.71	40.2	0.7	17.58	.35	27.4	0.4
18.8	34.96	.31	60.1	1.8	57.84	.30	57.2	2.2	36.27	.32	45.2	1.5	36.64	.76	39.5	0.2	17.93	.37	27.8	0.7
28.8	35.27	.32	61.9	1.9	58.14	.31	55.0	2.1	36.59	.33	46.7	1.7	37.40	.80	39.3	0.3	18.30	.39	28.5	1.1
July 8.8	35.59	.31	63.8	1.9	58.45	.32	52.9	2.0	36.92	.33	48.4	1.8	38.20	.81	39.6	0.8	18.69	.39	29.6	1.4
18.8	35.90	.31	65.7	1.9	58.77	.31	50.9	1.8	37.25	.33	50.2	1.8	39.01	.80	40.4	1.2	19.08	.39	31.0	1.6
28.7	36.21	.30	67.6	1.8	59.08	.30	49.1	1.5	37.58	.31	52.0	1.9	39.81	.78	41.6	1.7	19.47	.38	32.6	1.9
Aug. 7.7	36.51	.28	69.4	1.7	59.38	.28	47.6	1.2	37.89	.29	53.9	1.9	40.59	.74	43.3	2.1	19.85	.36	34.5	2.1
17.7	36.79	.26	71.1	1.5	59.66	.26	46.4	0.8	38.18	.27	55.8	1.9	41.33	.69	45.4	2.5	20.21	.33	36.6	2.2
27.7	37.05	.22	72.6	1.4	59.92	.24	45.6	0.5	38.45	.25	57.7	1.7	42.02	.62	47.9	2.8	20.54	.30	38.8	2.4
Sept. 6.6	37.27	.20	74.0	1.1	60.16	.20	45.1	0.2	38.70	.21	59.4	1.6	42.64	.54	50.7	3.0	20.84	.26	41.2	2.4
16.6	37.47	.17	75.1	0.9	60.36	.17	44.9	0.1	38.91	.18	61.0	1.5	43.18	.46	53.7	3.3	21.10	.23	43.6	2.4
26.6	37.64	.13	76.0	0.7	60.53	.14	45.0	0.5	39.09	.15	62.5	1.3	43.64	.37	57.0	3.4	21.33	.19	46.0	2.4
Oct. 6.5	37.77	.11	76.7	0.4	60.67	.10	45.5	0.7	39.24	.12	63.8	1.2	44.01	.28	60.4	3.5	21.52	.15	48.4	2.3
16.5	37.88	.07	77.1	0.3	60.77	.07	46.2	0.9	39.36	.09	65.0	1.0	44.29	.17	63.9	3.5	21.67	.11	50.7	2.2
26.5	37.95	.04	77.4	0.1	60.84	.04	47.1	1.1	39.45	.05	66.0	0.8	44.46	.06	67.4	3.4	21.78	.07	52.9	2.0
Nov. 5.5	37.99	.02	77.5	0.0	60.88	.01	48.2	1.1	39.50	.03	66.8	0.6	44.52	.04	70.8	3.2	21.85	.03	54.9	1.9
15.4	38.01	.01	77.5	0.3	60.89	.01	49.3	1.2	39.53	.01	67.4	0.4	44.48	.14	74.0	3.0	21.88	.01	56.8	1.6
25.4	38.00	.04	77.2	0.3	60.88	.04	50.5	1.2	39.52	.03	67.8	0.2	44.34	.26	77.0	2.7	21.87	.05	58.4	1.4
Dec. 5.4	37.96	.06	76.9	0.4	60.84	.07	51.7	1.1	39.49	.06	68.0	0.1	44.08	.35	79.7	2.3	21.82	.08	59.8	1.1
15.3	37.90	.08	76.5	0.5	60.77	.08	52.8	1.0	39.43	.08	68.1	0.1	43.73	.43	82.0	1.9	21.74	.12	60.9	0.8
25.3	37.82	.10	76.0	0.5	60.69	.10	53.8	0.9	39.35	.10	68.0	0.2	43.30	.51	83.9	1.3	21.62	.15	61.7	0.4
35.3	37.72		75.5		60.59		54.7		39.25		67.8		42.79		85.2		21.47		62.1	

(CONSTANTS OF STRUVE AND PETERS.)

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	*a* Arietis.				*β* Trianguli.				*ξ*¹ Ceti.				*γ* Trianguli.				67 Ceti.			
	Right Ascension.		Declination North.		Right Ascension.		Declination North.		Right Ascension.		Declination North.		Right Ascension.		Declination North.		Right Ascension.		Declination South.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	2 2		+23 1		2 4		+34 33		2 8		+8 25		2 11		+33 25		2 12		− 6 50	
	s		″		s		″		s		″		s		″		s		″	
Jan. 0.3	1.84	.12	57.7	0.3	6.90	.14	30.1	0.0	9.97	.11	8.3	0.6	53.49	.13	39.9	0.1	26.17	.10	37.4	0.8
10.3	1.72	.14	57.4	0.4	6.76	.16	30.1	0.2	9.86	.12	7.7	0.5	53.36	.16	40.0	0.2	26.07	.12	38.2	0.6
20.3	1.58	.15	57.0	0.6	6.60	.18	29.9	0.5	9.74	.13	7.2	0.6	53.20	.17	39.8	0.5	25.95	.14	38.8	0.5
30.3	1.43	.15	56.4	0.7	6.42	.18	29.4	0.8	9.61	.14	6.6	0.5	53.03	.18	39.3	0.7	25.81	.14	39.3	0.3
Feb. 9.2	1.28	.15	55.7	0.8	6.24	.17	28.6	1.0	9.47	.13	6.1	0.4	52.85	.17	38.6	0.9	25.67	.13	39.6	0.0
19.2	1.13	.13	54.9	0.9	6.07	.16	27.6	1.2	9.34	.12	5.7	0.4	52.68	.17	37.7	1.1	25.54	.13	39.6	0.1
Mar. 1.2	1.00	.11	54.0	0.9	5.91	.14	26.4	1.3	9.22	.11	5.3	0.3	52.51	.13	36.6	1.2	25.41	.11	39.5	0.4
11.1	0.89	.08	53.1	0.8	5.77	.10	25.1	1.3	9.11	.08	5.0	0.1	52.38	.11	35.4	1.3	25.30	.09	39.1	0.6
21.1	0.81	.05	52.3	0.8	5.67	.05	23.8	1.3	9.03	.05	4.9	0.0	52.27	.06	34.1	1.2	25.21	.05	38.5	0.8
31.1	0.76	.00	51.5	0.6	5.62	.01	22.5	1.3	8.98	.00	4.9	0.3	52.21	.02	32.9	1.2	25.16	.02	37.7	1.1
Apr. 10.0	0.76	.05	50.9	0.5	5.61	.04	21.2	1.1	8.98	.03	5.2	0.4	52.19	.04	31.7	1.0	25.14	.03	36.6	1.3
20.0	0.81	.09	50.4	0.2	5.65	.10	20.1	0.9	9.01	.08	5.6	0.6	52.23	.09	30.7	0.9	25.17	.07	35.3	1.6
30.0	0.90	.14	50.2	0.1	5.75	.16	19.2	0.6	9.09	.13	6.2	0.9	52.32	.14	29.8	0.6	25.24	.12	33.7	1.8
May 10.0	1.04	.19	50.3	0.3	5.91	.20	18.6	0.3	9.22	.17	7.1	1.1	52.46	.19	29.2	0.3	25.36	.16	31.9	1.9
19.9	1.23	.23	50.6	0.6	6.11	.25	18.3	0.0	9.39	.21	8.2	1.3	52.65	.25	28.9	0.0	25.52	.20	30.0	2.0
29.9	1.46	.27	51.2	0.8	6.36	.29	18.3	0.3	9.60	.25	9.5	1.5	52.90	.28	28.9	0.3	25.72	.24	28.0	2.2
June 8.9	1.73	.30	52.0	1.1	6.65	.32	18.6	0.6	9.85	.27	11.0	1.7	53.18	.31	29.2	0.7	25.96	.26	25.8	2.2
18.9	2.03	.32	53.1	1.4	6.97	.35	19.2	0.9	10.12	.30	12.7	1.8	53.49	.34	29.9	0.9	26.22	.29	23.6	2.2
28.8	2.35	.33	54.5	1.5	7.32	.36	20.1	1.2	10.42	.31	14.5	1.8	53.83	.35	30.8	1.2	26.51	.30	21.4	2.1
July 8.8	2.68	.33	56.0	1.7	7.68	.36	21.3	1.5	10.73	.31	16.3	1.9	54.18	.36	32.0	1.4	26.81	.31	19.3	2.0
18.8	3.01	.33	57.7	1.8	8.04	.36	22.8	1.7	11.04	.32	18.2	1.8	54.54	.36	33.4	1.6	27.12	.31	17.3	1.8
28.7	3.34	.32	59.5	1.8	8.40	.35	24.5	1.8	11.36	.30	20.0	1.8	54.90	.35	35.0	1.8	27.43	.31	15.5	1.6
Aug. 7.7	3.66	.31	61.3	1.9	8.75	.34	26.3	2.0	11.66	.29	21.8	1.6	55.25	.33	36.8	1.9	27.74	.29	13.9	1.3
17.7	3.97	.28	63.2	1.8	9.09	.31	28.3	2.1	11.95	.27	23.4	1.4	55.58	.32	38.7	2.0	28.03	.27	12.6	1.0
27.7	4.25	.26	65.0	1.8	9.40	.28	30.4	2.1	12.22	.25	24.8	1.3	55.90	.28	40.7	2.1	28.30	.25	11.6	0.7
Sept. 6.6	4.51	.23	66.8	1.7	9.68	.25	32.5	2.1	12.47	.22	26.1	1.1	56.18	.26	42.8	2.0	28.55	.22	10.9	0.4
16.6	4.74	.19	68.5	1.6	9.93	.22	34.6	2.1	12.69	.19	27.2	0.8	56.44	.22	44.8	2.0	28.77	.19	10.5	0.1
26.6	4.93	.17	70.1	1.4	10.15	.18	36.7	2.0	12.88	.16	28.0	0.6	56.66	.19	46.8	1.9	28.96	.16	10.4	0.3
Oct. 6.6	5.10	.13	71.5	1.3	10.33	.15	38.7	1.9	13.04	.13	28.6	0.4	56.85	.16	48.7	1.8	29.12	.13	10.7	0.5
16.5	5.23	.10	72.8	1.1	10.48	.11	40.6	1.8	13.17	.10	29.0	0.2	57.01	.12	50.5	1.7	29.25	.10	11.2	0.7
26.5	5.33	.07	73.9	0.9	10.59	.08	42.4	1.7	13.27	.07	29.2	0.0	57.13	.08	52.2	1.6	29.35	.07	11.9	0.9
Nov. 5.5	5.40	.04	74.8	0.8	10.67	.04	44.1	1.4	13.34	.04	29.2	0.1	57.21	.05	53.8	1.4	29.42	.03	12.8	1.0
15.4	5.44	.01	75.6	0.6	10.71	.00	45.5	1.3	13.38	.02	29.1	0.2	57.26	.02	55.2	1.2	29.45	.01	13.8	1.1
25.4	5.45	.02	76.2	0.4	10.71	.03	46.8	1.0	13.40	.02	28.9	0.4	57.28	.02	56.4	1.0	29.46	.01	14.9	1.1
Dec. 5.4	5.43	.05	76.6	0.2	10.68	.06	47.8	0.8	13.38	.04	28.5	0.4	57.26	.06	57.4	0.7	29.45	.05	16.0	1.0
15.4	5.38	.08	76.8	0.1	10.62	.09	48.6	0.5	13.34	.07	28.1	0.5	57.20	.08	58.1	0.5	29.40	.07	17.0	1.0
25.3	5.30	.10	76.9	0.2	10.53	.12	49.1	0.2	13.27	.08	27.6	0.5	57.12	.12	58.6	0.3	29.33	.09	18.0	0.9
35.3	5.20		76.7		10.41		49.3		13.19		27.1		57.00		58.9		29.24		18.9	

(CONSTANTS OF STRUVE AND PETERS.)

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	δ Hydri				ι Cassiopeiæ.				ξ² Ceti.				μ Hydri.				δ Ceti.			
	Right Ascension.		Declination *South.*		Right Ascension.		Declination *North.*		Right Ascension.		Declination *North.*		Right Ascension.		Declination *South.*		Right Ascension.		Declination *South.*	
	h m 2 20		° ′ −69 3		h m 2 21		° ′ +66 59		h m 2 23		° ′ + 8 3		h m 2 33		° ′ −79 29		h m 2 34		° ′ − 0 3	
	s		″		s		″		s		″		s		″		s		″	
Jan. 0.3	8.91	.53	106.8	0.8	33.17	.39	48.9	1.1	18.68	.10	5.3	0.6	38.78	1.14	106.3	0.8	48.67	.09	55.3	0.7
10.3	8.38	.55	107.6	0.2	32.78	.43	50.0	0.7	18.58	.12	4.7	0.5	37.64	1.19	107.1	0.2	48.58	.12	56.0	0.6
20.3	7.83	.57	107.8	0.4	32.35	.47	50.7	0.1	18.46	.13	4.2	0.5	36.45	1.22	107.3	0.4	48.46	.14	56.6	0.5
30.3	7.26	.56	107.4	1.0	31.88	.47	50.8	0.5	18.33	.14	3.7	0.5	35.23	1.21	106.9	1.0	48.32	.14	57.1	0.4
Feb. 9.2	6.70	.54	106.4	1.5	31.41	.46	50.3	1.0	18.19	.14	3.2	0.4	34.02	1.17	105.9	1.5	48.18	.14	57.5	0.2
19.2	6.16	.50	104.9	2.1	30.95	.43	49.3	1.5	18.05	.13	2.8	0.3	32.85	1.09	104.4	2.1	48.04	.14	57.7	0.1
Mar. 1.2	5.66	.44	102.8	2.5	30.52	.38	47.8	1.8	17.92	.12	2.5	0.3	31.76	0.99	102.3	2.6	47.90	.12	57.8	0.1
11.1	5.22	.38	100.3	2.9	30.14	.30	46.0	2.2	17.80	.09	2.2	0.1	30.77	0.87	99.7	2.9	47.78	.10	57.7	0.2
21.1	4.84	.30	97.4	3.2	29.84	.22	43.8	2.4	17.71	.06	2.1	0.1	29.90	0.72	96.8	3.2	47.68	.07	57.5	0.5
31.1	4.54	.21	94.2	3.5	29.62	.11	41.4	2.5	17.65	.02	2.2	0.2	29.18	0.55	93.6	3.5	47.61	.03	57.0	0.7
Apr. 10.1	4.33	.12	90.7	3.7	29.51	.00	38.9	2.5	17.63	.02	2.4	0.4	28.63	0.37	90.1	3.7	47.58	.00	56.3	0.9
20.0	4.21	.01	87.0	3.8	29.51	.10	36.4	2.4	17.65	.07	2.8	0.7	28.26	0.19	86.4	3.8	47.58	.05	55.4	1.1
30.0	4.20	.09	83.2	3.8	29.61	.21	34.0	2.3	17.72	.11	3.5	0.9	28.07	0.01	82.6	3.8	47.63	.10	54.3	1.3
May 10.0	4.29	.19	79.4	3.7	29.82	.32	31.7	2.0	17.83	.15	4.4	1.1	28.08	0.21	78.8	3.7	47.73	.14	53.0	1.5
19.9	4.48	.29	75.7	3.6	30.14	.41	29.7	1.6	17.98	.20	5.5	1.3	28.29	0.40	75.1	3.6	47.87	.19	51.5	1.7
29.9	4.77	.39	72.1	3.4	30.55	.49	28.1	1.3	18.18	.24	6.8	1.5	28.69	0.59	71.5	3.3	48.06	.22	49.8	1.9
June 8.9	5.16	.47	68.7	3.1	31.04	.56	26.8	0.9	18.42	.26	8.3	1.6	29.28	0.75	68.2	3.0	48.28	.25	47.9	1.9
18.9	5.63	.54	65.6	2.7	31.60	.61	25.9	0.4	18.68	.29	9.9	1.7	30.03	0.90	65.2	2.7	48.53	.28	46.0	2.0
28.8	6.17	.60	62.9	2.2	32.21	.65	25.5	0.1	18.97	.31	11.6	1.8	30.93	1.03	62.5	2.2	48.81	.30	44.0	2.0
July 8.8	6.77	.64	60.7	1.7	32.86	.66	25.6	0.6	19.28	.31	13.4	1.8	31.96	1.12	60.3	1.7	49.11	.30	42.0	1.9
18.8	7.41	.66	59.0	1.2	33.52	.66	26.2	1.0	19.59	.31	15.2	1.8	33.08	1.18	58.6	1.1	49.41	.31	40.1	1.8
28.8	8.07	.67	57.8	0.6	34.18	.66	27.2	1.4	19.90	.31	17.0	1.7	34.26	1.22	57.5	0.6	49.72	.31	38.3	1.6
Aug. 7.7	8.74	.65	57.2	0.0	34.84	.64	28.6	1.8	20.21	.30	18.7	1.6	35.48	1.21	56.9	0.1	50.03	.29	36.7	1.5
17.7	9.39	.62	57.2	0.7	35.48	.60	30.4	2.2	20.51	.28	20.3	1.4	36.69	1.16	57.0	0.6	50.32	.28	35.2	1.2
27.7	10.01	.57	57.9	1.2	36.08	.56	32.6	2.4	20.79	.25	21.7	1.3	37.85	1.08	57.6	1.2	50.60	.26	34.0	0.9
Sept. 6.6	10.58	.50	59.1	1.8	36.64	.50	35.0	2.8	21.04	.23	23.0	1.0	38.93	0.96	58.8	1.8	50.86	.24	33.1	0.7
16.6	11.08	.42	60.9	2.2	37.14	.44	37.8	3.0	21.27	.20	24.0	0.8	39.89	0.81	60.6	2.3	51.10	.21	32.4	0.4
26.6	11.50	.32	63.1	2.6	37.58	.37	40.8	3.1	21.47	.18	24.8	0.5	40.70	0.63	62.9	2.7	51.31	.18	32.0	0.1
Oct. 6.6	11.82	.22	65.7	2.9	37.95	.30	43.9	3.2	21.65	.15	25.3	0.4	41.33	0.43	65.6	2.9	51.49	.15	31.9	0.1
16.5	12.04	.12	68.6	3.1	38.25	.22	47.1	3.2	21.80	.11	25.7	0.1	41.76	0.22	68.5	3.2	51.64	.12	32.0	0.4
26.5	12.16	.00	71.7	3.2	38.47	.14	50.3	3.2	21.91	.09	25.8	0.0	41.98	0.01	71.7	3.2	51.76	.10	32.4	0.5
Nov. 5.5	12.16	.10	74.9	3.1	38.61	.06	53.5	3.1	22.00	.05	25.8	0.1	41.97	0.23	74.9	3.1	51.86	.06	32.9	0.7
15.5	12.06	.21	78.0	2.9	38.67	.03	56.6	2.9	22.05	.03	25.7	0.3	41.74	0.45	78.0	2.9	51.92	.04	33.6	0.7
25.4	11.85	.29	80.9	2.6	38.64	.12	59.5	2.7	22.08	.00	25.4	0.4	41.29	0.64	80.9	2.7	51.96	.00	34.3	0.8
Dec. 5.4	11.56	.38	83.5	2.2	38.52	.20	62.2	2.4	22.08	.03	25.0	0.4	40.65	0.82	83.6	2.2	51.96	.02	35.1	0.9
15.4	11.18	.45	85.7	1.7	38.32	.27	64.6	1.9	22.05	.06	24.6	0.5	39.83	0.97	85.8	1.7	51.94	.05	36.0	0.8
25.3	10.73	.50	87.4	1.1	38.05	.34	66.5	1.5	21.99	.08	24.1	0.5	38.86	1.08	87.5	1.2	51.89	.08	36.8	0.7
35.3	10.23		88.5		37.71		68.0		21.91		23.6		37.78		88.7		51.81		37.5	

(CONSTANTS OF STRUVE AND PETERS.)

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	θ Persei.				γ Ceti.				σ Arietis.				47 Cephei (H.).				ε Arietis.			
	Right Ascension.		Declination North.		Right Ascension.		Declination North.		Right Ascension.		Declination North.		Right Ascension.		Declination North.		Right Ascension.		Declination North.	
	h m 2 37		° ′ +48 50		h m 2 38		° ′ + 2 51		h m 2 46		° ′ +14 42		h m 2 53		° ′ +79 3		h m 2 53		° ′ +20 58	
	s		″		s		″		s		″		s		″		s		″	
Jan. 0.3	58.38	.18	46.2	0.8	34.68	.09	4.3	0.6	27.61	.09	25.1	0.4	58.24	0.81	48.0	1.9	60.01	.09	36.7	0.1
10.3	58.20	.21	47.0	0.3	34.59	.12	3.7	0.6	27.52	.11	24.7	0.4	57.43	0.93	49.9	1.3	59.92	.12	36.6	0.2
20.3	57.99	.23	47.3	0.0	34.47	.13	3.1	0.5	27.41	.14	24.3	0.4	56.50	1.02	51.2	0.8	59.80	.14	36.4	0.4
30.3	57.76	.25	47.3	0.4	34.34	.14	2.6	0.5	27.27	.15	23.9	0.5	55.48	1.06	52.0	0.2	59.66	.16	36.0	0.4
Feb. 9.2	57.51	.25	46.9	0.8	34.20	.14	2.1	0.3	27.12	.15	23.4	0.5	54.42	1.06	52.2	0.5	59.50	.16	35.6	0.5
19.2	57.26	.24	46.1	1.2	34.06	.14	1.8	0.1	26.97	.15	22.9	0.4	53.36	1.02	51.7	1.1	59.34	.16	35.1	0.6
Mar. 1.2	57.02	.21	44.9	1.4	33.92	.13	1.7	0.1	26.82	.13	22.5	0.4	52.34	0.92	50.6	1.5	59.18	.14	34.5	0.6
11.2	56.81	.17	43.5	1.6	33.79	.10	1.6	0.2	26.69	.11	22.1	0.4	51.42	0.79	49.1	2.0	59.04	.13	33.9	0.6
21.1	56.64	.13	41.9	1.8	33.69	.07	1.8	0.3	26.58	.08	21.7	0.3	50.63	0.63	47.1	2.4	58.91	.09	33.3	0.6
31.1	56.51	.07	40.1	1.8	33.62	.04	2.1	0.5	26.50	.05	21.4	0.1	50.00	0.44	44.7	2.6	58.82	.05	32.7	0.4
Apr. 10.1	56.44	.00	38.3	1.8	33.58	.00	2.6	0.7	26.45	.00	21.3	0.0	49.56	0.23	42.1	2.8	58.77	.00	32.3	0.3
20.0	56.44	.07	36.5	1.7	33.58	.05	3.3	0.9	26.45	.05	21.3	0.3	49.33	0.00	39.3	2.8	58.77	.04	32.0	0.2
30.0	56.51	.13	34.8	1.5	33.63	.10	4.2	1.2	26.50	.09	21.6	0.4	49.33	0.21	36.5	2.7	58.81	.09	31.8	0.0
May 10.0	56.64	.20	33.3	1.2	33.73	.14	5.4	1.4	26.59	.14	22.0	0.6	49.54	0.43	33.8	2.6	58.90	.14	31.8	0.3
20.0	56.84	.26	32.1	1.0	33.87	.18	6.8	1.5	26.73	.19	22.6	0.9	49.97	0.62	31.2	2.3	59.04	.18	32.1	0.5
29.9	57.10	.31	31.1	0.6	34.05	.22	8.3	1.7	26.92	.22	23.5	1.1	50.59	0.80	28.9	1.9	59.22	.23	32.6	0.7
June 8.9	57.41	.36	30.5	0.3	34.27	.25	10 0	1.8	27.14	.26	24.6	1.2	51.39	0.96	27.0	1.6	59.45	.26	33.3	0.9
18.9	57.77	.39	30.2	0.1	34.52	.28	11.8	1.8	27.40	.29	25.8	1.4	52.35	1.08	25.4	1.2	59.71	.29	34.2	1.1
28.9	58.16	.42	30.3	0.5	34.80	.29	13.6	1.9	27.69	.30	27.2	1.6	53.43	1.18	24.2	0.7	60.00	.31	35.3	1.3
July 8.8	58.58	.43	30.8	0.8	35.09	.31	15.5	1.9	27.99	.31	28.8	1.6	54.61	1.25	23.5	0.2	60.31	.32	36.6	1.4
18.8	59.01	.44	31.6	1.1	35.40	.31	17.4	1.8	28.30	.32	30.4	1.6	55.86	1.29	23.3	0.3	60.63	.33	38.0	1.5
28.8	59.45	.43	32.7	1.5	35.71	.31	19.2	1.6	28.62	.32	32.0	1.6	57.15	1.30	23.6	0.8	60.96	.32	39.5	1.6
Aug. 7.7	59.88	.42	34.2	1.7	36.02	.29	20.8	1.5	28.94	.31	33.6	1.6	58.45	1.29	24.4	1.2	61.28	.32	41.1	1.6
17.7	60.30	.40	35.9	1.9	36.31	.28	22.3	1.3	29.25	.29	35.2	1.5	59.74	1.25	25.6	1.7	61.60	.31	42.7	1.5
27.7	60.70	.37	37.8	2.1	36.59	.26	23.6	1.0	29.54	.28	36.7	1.3	60.99	1.18	27.3	2.1	61.91	.29	44.2	1.5
Sept. 6.7	61.07	.34	39.9	2.3	36.85	.24	24.6	0.8	29.82	.25	38.0	1.2	62.17	1.10	29.4	2.4	62.20	.26	45.7	1.3
16.6	61.41	.31	42.2	2.3	37.09	.21	25.4	0.5	30.07	.23	39.2	1.0	63.27	0.99	31.8	2.8	62.46	.24	47.0	1.3
26.6	61.72	.26	44.5	2.5	37.30	.19	25.9	0.3	30.30	.20	40.2	0.9	64.26	0.87	34.6	3.1	62.70	.21	48.3	1.1
Oct. 6.6	61.98	.23	47.0	2.4	37.49	.16	26.2	0.0	30.50	.17	41.1	0.7	65.13	0.73	37.7	3.2	62.91	.19	49.4	1.0
16.6	62.21	.18	49.4	2.4	37.65	.13	26.2	0.2	30.67	.14	41.8	0.5	65.86	0.57	40.9	3.5	63.10	.16	50.4	0.9
26.5	62.39	.14	51.8	2.4	37.78	.10	26.0	0.4	30.81	.12	42.3	0.3	66.43	0.40	44.4	3.5	63.26	.13	51.3	0.7
Nov. 5.5	62.53	.09	54.2	2.2	37.88	.07	25.6	0.5	30.93	.08	42.6	0.2	66.83	0.22	47.9	3.5	63.39	.09	52.0	0.6
15.5	62.62	.04	56.4	2.1	37.95	.03	25.1	0.6	31.01	.05	42.8	0.1	67.05	0.02	51.4	3.4	63.48	.06	52.6	0.5
25.4	62.66	.00	58.5	1.9	37.98	.01	24.5	0.7	31.06	.02	42.9	0.0	67.07	0.17	54.8	3.2	63.54	.03	53.1	0.3
Dec. 5.4	62.66	.06	60.4	1.6	37.99	.02	23.8	0.7	31.08	.01	42.9	0.1	66.90	0.36	58.0	3.0	63.57	.00	53.4	0.2
15.4	62.60	.10	62.0	1.3	37.97	.05	23.1	0.7	31.07	.04	42.8	0.2	66.54	0.54	61.0	2.7	63.57	.04	53.6	0.1
25.4	62.50	.14	63.3	1.0	37.92	.07	22.4	0.7	31.03	.07	42.6	0.3	66.00	0.71	63.7	2.2	63.53	.07	53.7	0.0
35.3	62.36		64.3		37.85		21.7		30.96		42.3		65.29		65.9		63.46		53.7	

(CONSTANTS OF STRUVE AND PETERS.)

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	*α* Ceti.				*β* Persei.				48 Cephei (H.).				*ζ* Arietis.				*α* Persei.			
	Right Ascension.		Declination *North.*		Right Ascension.		Declination *North.*		Right Ascension.		Declination *North.*		Right Ascension.		Declination *North.*		Right Ascension.		Declination *North.*	
	h m 2 57		° ′ + 3 43		h m 3 2		° ′ +40 36		h m 3 8		° ′ +77 23		h m 3 9		° ′ +20 42		h m 3 17		° ′ +49 32	
	s		″		s		″		s		″		s		″		s		″	
Jan. 0.4	31.00	.09	54.6	0.7	14.34	.13	25.5	0.7	45.70	0.65	76.3	1.9	39.83	.08	27.6	0.0	49.11	.15	23.4	1.1
10.3	30.91	.11	53.9	0.6	14.21	.16	26.2	0.3	45.05	0.76	78.2	1.5	39.75	.11	27.6	0.2	48.96	.19	24.5	0.8
20.3	30.80	.13	53.3	0.5	14.05	.19	26.5	0.0	44.29	0.85	79.7	0.9	39.64	.14	27.4	0.3	48.77	.22	25.3	0.4
30.3	30.67	.14	52.8	0.4	13.86	.20	26.5	0.2	43.44	0.91	80.6	0.3	39.50	.16	27.1	0.4	48.55	.25	25.7	0.0
Feb. 9.2	30.53	.15	52.4	0.3	13.66	.21	26.3	0.6	42.53	0.92	80.9	0.2	39.34	.16	26.7	0.4	48.30	.26	25.7	0.4
19.2	30.38	.15	52.1	0.2	13.45	.21	25.7	0.8	41.61	0.89	80.7	0.9	39.18	.17	26.3	0.5	48.04	.26	25.3	0.8
Mar. 1.2	30.23	.13	51.9	0.1	13.24	.20	24.9	1.1	40.72	0.82	79.8	1.4	39.01	.15	25.8	0.5	47.78	.25	24.5	1.0
11.2	30.10	.12	51.8	0.1	13.04	.16	23.8	1.2	39.90	0.72	78.4	1.8	38.86	.13	25.3	0.6	47.53	.21	23.5	1.4
21.1	29.98	.09	51.9	0.3	12.88	.13	22.6	1.3	39.18	0.58	76.6	2.2	38.73	.10	24.7	0.5	47.32	.17	22.1	1.5
31.1	29.89	.05	52.2	0.5	12.75	.08	21.3	1.4	38.60	0.43	74.4	2.5	38.63	.07	24.2	0.4	47.15	.12	20.6	1.7
Apr. 10.1	29.84	.01	52.7	0.6	12.67	.02	19.9	1.3	38.17	0.24	71.9	2.7	38.56	.02	23.8	0.3	47.03	.06	18.9	1.7
20.1	29.83	.03	53.3	0.8	12.65	.03	18.6	1.3	37.93	0.06	69.2	2.7	38.54	.03	23.5	0.1	46.97	.01	17.2	1.7
30.0	29.86	.08	54.1	1.1	12.68	.10	17.3	1.1	37.87	0.14	66.5	2.7	38.57	.07	23.4	0.0	46.98	.08	15.5	1.6
May 10.0	29.94	.12	55.2	1.3	12.78	.15	16.2	0.9	38.01	0.32	63.8	2.6	38.64	.12	23.4	0.2	47.06	.15	13.9	1.4
20.0	30.06	.17	56.5	1.4	12.93	.21	15.3	0.6	38.33	0.51	61.2	2.3	38.76	.17	23.6	0.5	47.21	.21	12.5	1.2
29.9	30.23	.20	57.9	1.6	13.14	.26	14.7	0.4	38.84	0.66	58.9	2.1	38.93	.22	24.1	0.6	47.42	.27	11.3	0.9
June 8.9	30.43	.24	59.5	1.7	13.40	.30	14.3	0.1	39.50	0.81	56.8	1.7	39.15	.25	24.7	0.8	47.69	.33	10.4	0.6
18.9	30.67	.27	61.2	1.8	13.70	.33	14.2	0.2	40.31	0.93	55.1	1.3	39.40	.28	25.6	1.0	48.02	.37	9.8	0.4
28.9	30.94	.29	63.0	1.9	14.03	.36	14.4	0.5	41.24	1.02	53.8	0.8	39.68	.30	26.6	1.2	48.39	.40	9.4	0.1
July 8.8	31.23	.30	64.9	1.8	14.39	.38	14.9	0.8	42.26	1.09	53.0	0.4	39.98	.32	27.8	1.3	48.79	.42	9.5	0.3
18.8	31.53	.31	66.7	1.7	14.77	.39	15.7	1.1	43.35	1.13	52.6	0.1	40.30	.32	29.1	1.4	49.21	.44	9.8	0.7
28.8	31.84	.30	68.4	1.6	15.16	.39	16.8	1.2	44.48	1.16	52.7	0.6	40.62	.33	30.5	1.5	49.65	.44	10.5	0.9
Aug. 7.8	32.14	.30	70.0	1.5	15.55	.38	18.0	1.5	45.64	1.15	53.3	1.0	40.95	.32	32.0	1.5	50.09	.44	11.4	1.3
17.7	32.44	.29	71.5	1.2	15.93	.36	19.5	1.6	46.79	1.12	54.3	1.5	41.27	.31	33.5	1.4	50.53	.43	12.7	1.5
27.7	32.73	.28	72.7	1.1	16.29	.35	21.1	1.8	47.91	1.08	55.8	1.9	41.58	.29	34.9	1.4	50.96	.41	14.2	1.7
Sept. 6.7	33.01	.25	73.8	0.8	16.64	.33	22.9	1.9	48.99	1.01	57.7	2.3	41.87	.28	36.3	1.2	51.37	.38	15.9	1.8
16.6	33.26	.22	74.6	0.5	16.97	.29	24.8	1.9	50.00	0.92	60.0	2.6	42.15	.25	37.5	1.2	51.75	.36	17.7	2.0
26.6	33.48	.20	75.1	0.3	17.26	.27	26.7	1.9	50.92	0.83	62.6	2.8	42.40	.23	38.7	1.1	52,11	.32	19.7	2.2
Oct. 6.6	33.68	.18	75.4	0.0	17.53	.23	28.6	2.0	51.75	0.71	65.4	3.1	42.63	.20	39.8	0.9	52.43	.28	21.9	2.2
16.6	33.86	.15	75.4	0.1	17.76	.20	30.6	1.9	52.46	0.57	68.5	3.3	42.83	.17	40.7	0.8	52.71	.25	24.1	2.2
26.5	34.01	.12	75.3	0.4	17.96	.16	32.5	1.8	53.03	0.43	71.8	3.4	43.00	.15	41.5	0.6	52.96	.20	26.3	2.3
Nov. 5.5	34.13	.08	74.9	0.5	18.12	.12	34.3	1.8	53.46	0.27	75.2	3.4	43.15	.11	42.1	0.6	53.16	.16	28.6	2.2
15.5	34.21	.06	74.4	0.6	18.24	.08	36.1	1.6	53.73	0.11	78.6	3.4	43.26	.08	42.7	0.4	53.32	.11	30.8	2.1
25.5	34.27	.03	73.8	0.6	18.32	.03	37.7	1.5	53.84	0.06	82.0	3.3	43.34	.04	43.1	0.3	53.43	.05	32.9	2.0
Dec. 5.4	34.30	.00	73.2	0.7	18.35	.01	39.2	1.3	53.78	0.24	85.3	3.0	43.38	.01	43.4	0.2	53.48	.00	34.9	1.8
15.4	34.30	.04	72.5	0.7	18.34	.05	40.5	1.1	53.54	0.40	88.3	2.7	43.39	.02	43.6	0.1	53.48	.06	36.7	1.6
25.4	34.26	.06	71.8	0.7	18.29	.10	41.6	0.8	53.14	0.55	91.0	2.2	43.37	.07	43.7	0.0	53.42	.11	38.3	1.3
35.3	34.20		71.1		18.19		42.4		52.59		93.2		43.30		43.7		53.31		39.6	

(CONSTANTS OF STRUVE AND PETERS.)

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	*ι* Hydri.				*f* Tauri.				*ε* Eridani.				*δ* Persei.				*γ* Camelopardalis.			
	Right Ascension.		Declination *South.*		Right Ascension.		Declination *North.*		Right Ascension.		Declination *South.*		Right Ascension.		Declination *North.*		Right Ascension.		Declination *North.*	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	3 18		−77 42		3 25		+12 37		3 28		− 9 45		3 36		+47 29		3 40		+71 2	
	s		″		s		″		s		″		s		″		s		″	
Jan. 0.4	17.23	0.90	95.6	1.5	50.67	.07	29.4	0.4	38.52	.08	64.4	1.1	26.42	.12	56.2	1.1	45.10	.33	79.1	2.1
10.3	16.33	0.98	97.1	0.9	50.60	.10	29.0	0.3	38.44	.11	65.5	0.9	26.30	.16	57.3	0.9	44.77	.42	81.2	1.7
20.3	15.35	1.05	98.0	0.3	50.50	.13	28.7	0.4	38.33	.13	66.4	0.7	26.14	.20	58.2	0.5	44.35	.51	82.9	1.1
30.3	14.30	1.07	98.3	0.2	50.37	.15	28.3	0.4	38.20	.15	67.1	0.5	25.94	.23	58.7	0.1	43.84	.56	84.0	0.6
Feb. 9.3	13.23	1.07	98.1	0.9	50.22	.15	27.9	0.3	38.05	.17	67.6	0.2	25.71	.25	58.8	0.2	43.28	.59	84.6	0.1
19.2	12.16	1.04	97.2	1.4	50.07	.16	27.6	0.4	37.88	.16	67.8	0.0	25.46	.26	58.6	0.5	42.69	.59	84.7	0.4
Mar. 1.2	11.12	0.99	95.8	1.9	49.91	.15	27.2	0.3	37.72	.16	67.8	0.3	25.20	.24	58.1	0.9	42.10	.57	84.3	1.0
11.2	10.13	0.90	93.9	2.4	49.76	.14	26.9	0.2	37.56	.15	67.5	0.5	24.96	.22	57.2	1.1	41.53	.51	83.3	1.4
21.2	9.23	0.79	91.5	2.7	49.62	.11	26.7	0.1	37.41	.12	67.0	0.8	24.74	.18	56.1	1.4	41.02	.44	81.9	1.9
31.1	8.44	0.66	88.8	3.1	49.51	.08	26.6	0.0	37.29	.08	66.2	1.1	24.56	.13	54.7	1.5	40.58	.34	80.0	2.1
Apr. 10.1	7.78	0.52	85.7	3.4	49.43	.03	26.6	0.2	37.21	.05	65.1	1.3	24.43	.07	53.2	1.5	40.24	.22	77.9	2.4
20.1	7.26	0.37	82.3	3.6	49.40	.01	26.8	0.3	37.16	.01	63.8	1.6	24.36	.02	51.7	1.6	40.02	.10	75.5	2.4
30.0	6.89	0.20	78.7	3.7	49.41	.05	27.1	0.5	37.15	.04	62.2	1.8	24.34	.06	50.1	1.5	39.92	.03	73.1	2.5
May 10.0	6.69	0.02	75.0	3.7	49.46	.10	27.6	0.6	37.19	.08	60.4	1.9	24.40	.12	48.6	1.3	39.95	.16	70.6	2.5
20.0	6.67	0.15	71.3	3.7	49.56	.15	28.2	0.9	37.27	.13	58.5	2.1	24.52	.18	47.3	1.2	40.11	.29	68.1	2.2
30.0	6.82	0.31	67.6	3.6	49.71	.19	29.1	1.0	37.40	.17	56.4	2.2	24.70	.24	46.1	0.9	40.40	.41	65.9	2.1
June 8.9	7.13	0.48	64.0	3.3	49.90	.23	30.1	1.2	37.57	.21	54.2	2.2	24.94	.30	45.2	0.7	40.81	.51	63.8	1.7
18.9	7.61	0.63	60.7	3.0	50.13	.26	31.3	1.4	37.78	.24	52.0	2.3	25.24	.34	44.5	0.4	41.32	.60	62.1	1.4
28.9	8.24	0.76	57.7	2.7	50.39	.28	32.7	1.4	38.02	.26	49.7	2.2	25.58	.38	44.1	0.1	41.92	.68	60.7	1.1
July 8.9	9.00	0.87	55.0	2.3	50.67	.30	34.1	1.5	38.28	.29	47.5	2.0	25.96	.40	44.0	0.2	42.60	.74	59.6	0.6
18.8	9.87	0.96	52.7	1.7	50.97	.31	35.6	1.5	38.57	.29	45.5	1.9	26.36	.42	44.2	0.5	43.34	.78	59.0	0.2
28.8	10.83	1.02	51.0	1.1	51.28	.31	37.1	1.4	38.86	.30	43.6	1.7	26.78	.42	44.7	0.8	44.12	.80	58.8	0.2
Aug. 7.8	11.85	1.04	49.9	0.6	51.59	.31	38.5	1.4	39.16	.30	41.9	1.4	27.20	.43	45.5	1.0	44.92	.81	59.0	0.7
17.7	12.89	1.04	49.3	0.1	51.90	.30	39.9	1.3	39.46	.30	40.5	1.1	27.63	.42	46.5	1.3	45.73	.81	59.7	1.0
27.7	13.93	1.00	49.4	0.6	52.20	.29	41.2	1.2	39.76	.28	39.4	0.7	28.05	.41	47.8	1.5	46.54	.79	60.7	1.5
Sept. 6.7	14.93	0.93	50.0	1.3	52.49	.28	42.4	1.0	40.04	.26	38.7	0.3	28.46	.39	49.3	1.6	47.33	.76	62.2	1.8
16.7	15.86	0.83	51.3	1.8	52.77	.25	43.4	0.8	40.30	.25	38.4	0.0	28.85	.36	50.9	1.8	48.09	.71	64.0	2.1
26.6	16.69	0.71	53.1	2.3	53.02	.23	44.2	0.6	40.55	.22	38.4	0.3	29.21	.33	52.7	1.9	48.80	.65	66.1	2.4
Oct. 6.6	17.40	0.55	55.4	2.7	53.25	.21	44.8	0.4	40.77	.20	38.7	0.7	29.54	.30	54.6	2.0	49.45	.58	68.5	2.7
16.6	17.95	0.38	58.1	3.0	53.46	.18	45.2	0.3	40.97	.17	39.4	1.0	29.84	.27	56.6	2.0	50.03	.51	71.2	2.8
26.6	18.33	0.19	61.1	3.2	53.64	.15	45.5	0.1	41.14	.14	40.4	1.2	30.11	.22	58.6	2.1	50.54	.41	74.0	3.0
Nov. 5.5	18.52	0.00	64.3	3.3	53.79	.13	45.6	0.0	41.28	.10	41.6	1.3	30.33	.18	60.7	2.0	50.95	.32	77.0	3.1
15.5	18.52	0.19	67.6	3.2	53.92	.09	45.6	0.1	41.38	.08	42.9	1.4	30.51	.14	62.7	2.0	51.27	.21	80.1	3.1
25.5	18.33	0.37	70.8	3.0	54.01	.06	45.5	0.2	41.46	.05	44.3	1.5	30.65	.08	64.7	1.9	51.48	.09	83.2	3.1
Dec. 5.4	17.96	0.55	73.8	2.7	54.07	.02	45.3	0.3	41.51	.01	45.8	1.4	30.73	.03	66.6	1.7	51.57	.03	86.3	2.9
15.4	17.41	0.70	76.5	2.3	54.09	.01	45.0	0.3	41.52	.03	47.2	1.4	30.76	.03	68.3	1.5	51.54	.14	89.2	2.6
25.4	16.71	0.83	78.8	1.8	54.08	.05	44.7	0.3	41.49	.06	48.6	1.2	30.73	.08	69.8	1.3	51.40	.26	91.8	2.3
35.4	15.88		80.6		54.03		44.4		41.43		49.8		30.65		71.1		51.14		94.1	

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	η Tauri.				ζ Persei.				γ Hydri.				ε Persei.				γ Eridani.			
	Right Ascension.		Declination North.		Right Ascension.		Declination North.		Right Ascension.		Declination South.		Right Ascension.		Declination North.		Right Ascension.		Declination South.	
	h m 3 42		° ′ +23 49		h m 3 48		° ′ +31 36		h m 3 48		° ′ −74 30		h m 3 51		° ′ +39 44		h m 3 53		° ′ −13 45	
	s		″		s		″		s		″		s		″		s		″	
Jan. 0.4	4.24	.07	28.4	0.1	24.44	.07	53.0	0.6	42.40	.64	81.7	2.0	44.62	.08	55.8	0.8	47.14	.07	68.6	1.3
10.3	4.17	.10	28.5	0.0	24.37	.11	53.6	0.3	41.76	.73	83.7	1.4	44.54	.12	56.6	0.7	47.07	.10	69.9	1.1
20.3	4.07	.13	28.5	0.1	24.26	.14	53.9	0.1	41.03	.80	85.1	0.8	44.42	.16	57.3	0.4	46.97	.13	71.0	0.9
30.3	3.94	.15	28.4	0.1	24.12	.17	54.0	0.0	40.23	.85	85.9	0.3	44.26	.19	57.7	0.2	46.84	.16	71.9	0.6
Feb. 9.3	3.79	.17	28.3	0.3	23.95	.18	54.0	0.2	39.38	.86	86.2	0.4	44.07	.21	57.9	0.2	46.68	.17	72.5	0.3
19.2	3.62	.18	28.0	0.4	23.77	.19	53.8	0.4	38.52	.86	85.8	0.9	43.86	.22	57.7	0.4	46.51	.17	72.8	0.0
Mar. 1.2	3.44	.17	27.6	0.5	23.58	.19	53.4	0.6	37.66	.83	84.9	1.4	43.64	.22	57.3	0.6	46.34	.17	72.8	0.2
11.2	3.27	.16	27.1	0.5	23.39	.17	52.8	0.7	36.83	.78	83.5	1.9	43.42	.19	56.7	0.9	46.17	.16	72.6	0.6
21.2	3.11	.12	26.6	0.5	23.22	.15	52.1	0.7	36.05	.70	81.6	2.4	43.23	.17	55.8	1.0	46.01	.14	72.0	0.9
31.1	2.99	.10	26.1	0.5	23.07	.11	51.4	0.8	35.35	.61	79.2	2.7	43.06	.12	54.8	1.1	45.87	.11	71.1	1.2
Apr. 10.1	2.89	.05	25.6	0.4	22.96	.06	50.6	0.8	34.74	.51	76.5	3.1	42.94	.08	53.7	1.1	45.76	.07	69.9	1.4
20.1	2.84	.01	25.2	0.4	22.90	.01	49.8	0.8	34.23	.39	73.4	3.4	42.86	.03	52.6	1.2	45.69	.03	68.5	1.6
30.1	2.83	.05	24.8	0.2	22.89	.04	49.0	0.6	33.84	.25	70.0	3.5	42.83	.04	51.4	1.1	45.66	.01	66.9	1.9
May 10.0	2.88	.09	24.6	0.0	22.93	.09	48.4	0.5	33.59	.12	66.5	3.7	42.87	.10	50.3	1.0	45.67	.06	65.0	2.1
20.0	2.97	.14	24.6	0.2	23.02	.15	47.9	0.3	33.47	.03	62.8	3.7	42.97	.15	49.3	0.8	45.73	.10	62.9	2.2
30.0	3.11	.19	24.8	0.3	23.17	.19	47.6	0.2	33.50	.16	59.1	3.6	43.12	.21	48.5	0.6	45.83	.15	60.7	2.3
June 8.9	3.30	.23	25.1	0.6	23.36	.24	47.4	0.1	33.66	.30	55.5	3.5	43.33	.25	47.9	0.3	45.98	.19	58.4	2.4
18.9	3.53	.27	25.7	0.7	23.60	.27	47.5	0.3	33.96	.43	52.0	3.3	43.58	.29	47.6	0.2	46.17	.22	56.0	2.4
28.9	3.80	.29	26.4	0.9	23.87	.30	47.8	0.5	34.39	.55	48.7	3.0	43.87	.33	47.4	0.1	46.39	.25	53.6	2.3
July 8.9	4.09	.31	27.3	1.0	24.17	.33	48.3	0.7	34.94	.64	45.7	2.6	44.20	.36	47.5	0.4	46.64	.27	51.3	2.2
18.8	4.40	.32	28.3	1.1	24.50	.34	49.0	0.9	35.58	.73	43.1	2.1	44.56	.37	47.9	0.6	46.91	.29	49.1	2.0
28.8	4.72	.33	29.4	1.2	24.84	.35	49.9	1.0	36.31	.79	41.0	1.6	44.93	.38	48.5	0.8	47.20	.30	47.1	1.7
Aug. 7.8	5.05	.33	30.6	1.2	25.19	.36	50.9	1.1	37.10	.83	39.4	1.0	45.31	.38	49.3	0.9	47.50	.30	45.4	1.4
17.8	5.38	.33	31.8	1.3	25.55	.34	52.0	1.2	37.93	.85	38.4	0.3	45.69	.38	50.2	1.1	47.80	.30	44.0	1.1
27.7	5.71	.31	33.1	1.2	25.89	.34	53.2	1.2	38.78	.83	38.1	0.2	46.07	.37	51.3	1.3	48.10	.29	42.9	0.7
Sept. 6.7	6.02	.30	34.3	1.2	26.23	.32	54.4	1.3	39.61	.79	38.3	0.9	46.44	.36	52.6	1.4	48.39	.28	42.2	0.3
16.7	6.32	.28	35.5	1.1	26.55	.31	55.7	1.2	40.40	.74	39.2	1.4	46.80	.33	54.0	1.4	48.67	.26	41.9	0.1
26.6	6.60	.26	36.6	1.0	26.86	.28	56.9	1.3	41.14	.64	40.6	2.0	47.13	.32	55.4	1.5	48.93	.24	42.0	0.5
Oct. 6.6	6.86	.24	37.6	0.9	27.14	.26	58.2	1.2	41.78	.54	42.6	2.5	47.45	.28	56.9	1.6	49.17	.22	42.5	0.9
16.6	7.10	.21	38.5	0.8	27.40	.23	59.4	1.2	42.32	.41	45.1	2.9	47.73	.26	58.5	1.6	49.39	.19	43.4	1.1
26.6	7.31	.18	39.3	0.7	27.63	.20	60.6	1.1	42.73	.27	48.0	3.1	47.99	.22	60.1	1.5	49.58	.17	44.5	1.5
Nov. 5.5	7.49	.15	40.0	0.7	27.83	.17	61.7	1.1	43.00	.13	51.1	3.3	48.21	.19	61.6	1.6	49.75	.13	46.0	1.6
15.5	7.64	.12	40.7	0.5	28.00	.13	62.8	1.0	43.13	.03	54.4	3.3	48.40	.14	63.2	1.5	49.88	.10	47.6	1.7
25.5	7.76	.08	41.2	0.5	28.13	.09	63.8	1.0	43.10	.18	57.7	3.2	48.54	.10	64.7	1.4	49.98	.07	49.3	1.7
Dec. 5.5	7.84	.04	41.7	0.4	28.22	.05	64.8	0.8	42.92	.32	60.9	3.0	48.64	.06	66.1	1.3	50.05	.03	51.0	1.8
15.4	7.88	.00	42.1	0.3	28.27	.00	65.6	0.8	42.60	.46	63.9	2.6	48.70	.00	67.4	1.2	50.08	.01	52.8	1.6
25.4	7.88	.04	42.4	0.2	28.27	.03	66.4	0.6	42.14	.58	66.5	2.2	48.70	.04	68.6	1.0	50.07	.04	54.4	1.5
35.4	7.84		42.6		28.24		67.0		41.56		68.7		48.66		69.6		50.03		55.9	

(CONSTANTS OF STRUVE AND PETERS.)

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	A¹ Tauri.				*c* Persei.				*o*¹ Eridani.				*γ* Tauri.				*ε* Tauri.			
	Right Ascension.		Declination *North*.		Right Ascension.		Declination *North*.		Right Ascension.		Declination *South*.		Right Ascension.		Declination *North*.		Right Ascension.		Declination *North*.	
	h m 3 59		° ′ +21 49		h m 4 2		° ′ +47 28		h m 4 7		° ′ − 7 4		h m 4 14		° ′ +15 24		h m 4 23		° ′ +18 58	
	s		″		s		″		s		″		s		″		s		″	
Jan. 0.4	18.75	.05	62.4	0.1	3.19	.09	18.4	1.3	25.49	.05	33.2	1.2	36.80	.04	29.7	0.3	18.12	.03	45.1	0.0
10.4	18.70	.09	62.5	0.0	3.10	.14	19.7	1.0	25.44	.09	34.4	1.0	36.76	.07	29.4	0.2	18.09	.07	45.1	0.1
20.4	18.61	.12	62.5	0.1	2.96	.19	20.7	0.7	25.35	.12	35.4	0.8	36.69	.11	29.2	0.2	18.02	.11	45.0	0.1
30.3	18.49	.15	62.4	0.1	2.77	.22	21.4	0.4	25.23	.14	36.2	0.6	36.58	.14	29.0	0.2	17.91	.13	44.9	0.1
Feb. 9.3	18.34	.17	62.3	0.2	2.55	.24	21.8	0.0	25.09	.16	36.8	0.3	36.44	.16	28.8	0.2	17.78	.16	44.8	0.2
19.3	18.17	.17	62.1	0.3	2.31	.26	21.8	0.3	24.93	.17	37.1	0.1	36.28	.16	28.6	0.3	17.62	.18	44.6	0.2
Mar. 1.2	18.00	.17	61.8	0.4	2.05	.25	21.5	0.6	24.76	.17	37.2	0.1	36.12	.17	28.3	0.2	17.44	.17	44.4	0.2
11.2	17.83	.16	61.4	0.4	1.80	.24	20.9	0.9	24.59	.16	37.1	0.3	35.95	.17	28.1	0.2	17.27	.17	44.2	0.2
21.2	17.67	.14	61.0	0.4	1.56	.20	20.0	1.1	24.43	.14	36.8	0.6	35.78	.14	27.9	0.1	17.10	.15	44.0	0.2
31.2	17.53	.11	60.6	0.3	1.36	.16	18.9	1.3	24.29	.11	36.2	0.8	35.64	.11	27.8	0.1	16.95	.12	43.8	0.2
Apr. 10.1	17.42	.07	60.3	0.3	1.20	.10	17.6	1.5	24.18	.08	35.4	1.1	35.53	.08	27.7	0.0	16.83	.08	43.6	0.2
20.1	17.35	.02	60.0	0.2	1.10	.05	16.1	1.5	24.10	.04	34.3	1.3	35.45	.03	27.7	0.2	16.75	.04	43.4	0.0
30.1	17.33	.03	59.8	0.1	1.05	.02	14.6	1.5	24.06	.00	33.0	1.5	35.42	.01	27.9	0.2	16.71	.00	43.4	0.0
May 10.0	17.36	.08	59.7	0.0	1.07	.09	13.1	1.4	24.06	.05	31.5	1.7	35.43	.06	28.1	0.4	16.71	.05	43.4	0.2
20.0	17.44	.12	59.7	0.2	1.16	.15	11.7	1.2	24.11	.10	29.8	1.9	35.49	.10	28.5	0.6	16.76	.10	43.6	0.3
30.0	17.56	.17	59.9	0.4	1.31	.22	10.5	1.1	24.21	.14	27.9	2.0	35.59	.15	29.1	0.7	16.86	.15	43.9	0.5
June 9.0	17.73	.21	60.3	0.6	1.53	.27	9.4	0.8	24.35	.18	25.9	2.0	35.74	.19	29.8	0.9	17.01	.19	44.4	0.6
18.9	17.94	.25	60.9	0.7	1.80	.31	8.6	0.6	24.53	.21	23.9	2.1	35.93	.23	30.7	1.0	17.20	.22	45.0	0.8
28.9	18.19	.28	61.6	0.9	2.11	.36	8.0	0.3	24.74	.24	21.8	2.1	36.16	.25	31.7	1.0	17.42	.25	45.8	0.9
July 8.9	18.47	.30	62.5	1.0	2.47	.38	7.7	0.1	24.98	.27	19.7	2.0	36.41	.28	32.7	1.2	17.67	.28	46.7	0.9
18.9	18.77	.31	63.5	1.1	2.85	.41	7.6	0.2	25.25	.28	17.7	1.9	36.69	.30	33.9	1.2	17.95	.30	47.6	1.0
28.8	19.08	.32	64.6	1.1	3.26	.42	7.8	0.5	25.53	.29	15.8	1.6	36.99	.31	35.1	1.2	18.25	.31	48.6	1.1
Aug. 7.8	19.40	.33	65.7	1.1	3.68	.43	8.3	0.7	25.82	.30	14.2	1.4	37.30	.31	36.3	1.1	18.56	.32	49.7	1.0
17.8	19.73	.32	66.8	1.1	4.11	.43	9.0	1.0	26.12	.30	12.8	1.2	37.61	.31	37.4	1.1	18.88	.32	50.7	1.0
27.8	20.05	.31	67.9	1.1	4.54	.42	10.0	1.2	26.42	.29	11.6	0.8	37.92	.31	38.5	0.9	19.20	.31	51.7	0.9
Sept. 6.7	20.36	.31	69.0	1.0	4.96	.40	11.2	1.3	26.71	.28	10.8	0.4	38.23	.30	39.4	0.8	19.51	.30	52.6	0.8
16.7	20.67	.29	70.0	1.0	5.36	.39	12.5	1.5	26.99	.26	10.4	0.1	38.53	.28	40.2	0.7	19.81	.30	53.4	0.7
26.7	20.96	.26	71.0	0.8	5.75	.36	14.0	1.7	27.25	.25	10.3	0.2	38.81	.27	40.9	0.5	20.11	.28	54.1	0.6
Oct. 6.6	21.22	.25	71.8	0.7	6.11	.33	15.7	1.7	27.50	.23	10.5	0.6	39.08	.25	41.4	0.4	20.39	.26	54.7	0.5
16.6	21.47	.22	72.5	0.7	6.44	.30	17.4	1.8	27.73	.21	11.1	0.8	39.33	.23	41.8	0.2	20.65	.24	55.2	0.4
26.6	21.69	.20	73.2	0.5	6.74	.26	19.2	1.9	27.94	.18	11.9	1.1	39.56	.20	42.0	0.1	20.89	.21	55.6	0.2
Nov. 5.6	21.89	.17	73.7	0.4	7.00	.22	21.1	1.9	28.12	.15	13.0	1.3	39.76	.18	42.1	0.0	21.10	.19	55.8	0.2
15.5	22.06	.13	74.1	0.4	7.22	.17	23.0	1.9	28.27	.12	14.3	1.4	39.94	.14	42.1	0.0	21.29	.16	56.0	0.1
25.5	22.19	.10	74.5	0.3	7.39	.12	24.9	1.9	28.39	.08	15.7	1.5	40.08	.11	42.1	0.2	21.45	.12	56.1	0.1
Dec. 5.5	22.29	.06	74.8	0.3	7.51	.07	26.8	1.8	28.47	.05	17.2	1.4	40.19	.07	41.9	0.1	21.57	.08	56.2	0.0
15.4	22.35	.02	75.1	0.2	7.58	.01	28.6	1.6	28.52	.01	18.6	1.4	40.26	.03	41.8	0.2	21.65	.04	56.2	0.0
25.4	22.37	.02	75.3	0.1	7.59	.05	30.2	1.4	28.53	.03	20.0	1.2	40.29	.00	41.6	0.2	21.69	.00	56.2	0.0
35.4	22.35		75.4		7.54		31.6		28.50		21.2		40.29		41.4		21.69		56.2	

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	δ Mensæ.				*m* Persei.				α Tauri. (*Aldebaran.*)				τ Tauri.				α Camelopardalis.			
	Right Ascension.		Declination *South.*		Right Ascension.		Declination *North.*		Right Ascension.		Declination *North.*		Right Ascension.		Declination *North.*		Right Ascension.		Declination *North.*	
	h m 4 23		° ′ −80 25		h m 4 26		° ′ +42 52		h m 4 30		° ′ +16 19		h m 4 36		° ′ +22 46		h m 4 44		° ′ +66 11	
	s		″		s		″		s		″		s		″		s		″	
Jan. 0.4	74.48	0.99	53.4	2.3	60.70	.05	17.0	1.2	41.90	.02	36.5	0.2	46.98	.02	59.3	0.2	60.85	.12	27.3	2.4
10.4	73.49	1.16	55.7	1.8	60.65	.10	18.2	1.0	41.88	.07	36.3	0.1	46.96	.06	59.5	0.1	60.73	.21	29.7	2.0
20.4	72.33	1.29	57.5	1.3	60.55	.15	19.2	0.7	41.81	.10	36.2	0.2	46.90	.10	59.6	0.1	60.52	.30	31.7	1.7
30.3	71.04	1.39	58.8	0.7	60.40	.19	19.9	0.5	41.71	.13	36.0	0.2	46.80	.14	59.7	0.0	60.22	.37	33.4	1.3
Feb. 9.3	69.65	1.45	59.5	0.2	60.21	.21	20.4	0.2	41.58	.15	35.8	0.1	46.66	.16	59.7	0.0	59.85	.43	34.7	0.8
19.3	68.20	1.47	59.7	0.4	60.00	.24	20.6	0.1	41.43	.17	35.7	0.2	46.50	.17	59.7	0.1	59.42	.46	35.5	0.4
Mar. 1.3	66.73	1.45	59.3	1.0	59.76	.23	20.5	0.3	41.26	.18	35.5	0.2	46.33	.19	59.6	0.2	58.96	.46	35.9	0.2
11.2	65.28	1.39	58.3	1.4	59.53	.23	20.2	0.6	41.08	.17	35.3	0.2	46.14	.17	59.4	0.3	58.50	.46	35.7	0.6
21.2	63.89	1.31	56.9	1.9	59.30	.20	19.6	0.9	40.91	.15	35.1	0.1	45.97	.16	59.1	0.3	58.04	.42	35.1	1.1
31.2	62.58	1.18	55.0	2.4	59.10	.16	18.7	1.0	40.76	.12	35.0	0.1	45.81	.13	58.8	0.2	57.62	.36	34.0	1.4
Apr. 10.1	61.40	1.04	52.6	2.7	58.94	.12	17.7	1.1	40.64	.09	34.9	0.0	45.68	.10	58.6	0.3	57.26	.28	32.6	1.8
20.1	60.36	0.86	49.9	3.0	58.82	.06	16.6	1.2	40.55	.05	34.9	0.1	45.58	.05	58.3	0.3	56.98	.20	30.8	2.0
30.1	59.50	0.66	46.9	3.3	58.76	.01	15.4	1.2	40.50	.00	35.0	0.2	45.53	.01	58.0	0.1	56.78	.09	28.8	2.2
May 10.1	58.84	0.46	43.6	3.4	58.75	.06	14.2	1.2	40.50	.05	35.2	0.3	45.52	.04	57.9	0.1	56.69	.00	26.6	2.3
20.0	58.38	0.24	40.2	3.5	58.81	.11	13.0	1.1	40.55	.09	35.5	0.5	45.56	.09	57.8	0.1	56.69	.11	24.3	2.2
30.0	58.14	0.02	36.7	3.6	58.92	.17	11.9	0.9	40.64	.13	36.0	0.6	45.65	.13	57.9	0.2	56.80	.22	22.1	2.1
June 9.0	58.12	0.21	33.1	3.5	59.09	.23	11.0	0.7	40.77	.18	36.6	0.7	45.78	.18	58.1	0.3	57.02	.31	20.0	2.0
19.0	58.33	0.43	29.6	3.4	59.32	.27	10.3	0.6	40.95	.21	37.3	0.9	45.96	.22	58.4	0.5	57.33	.40	18.0	1.8
28.9	58.76	0.63	26.2	3.1	59.59	.31	9.7	0.3	41.16	.25	38.2	0.9	46.18	.25	58.9	0.6	57.73	.47	16.2	1.6
July 8.9	59.39	0.82	23.1	2.8	59.90	.35	9.4	0.1	41.41	.27	39.1	1.0	46.43	.28	59.5	0.7	58.20	.54	14.6	1.2
18.9	60.21	0.98	20.3	2.4	60.25	.37	9.3	0.1	41.68	.29	40.1	1.1	46.71	.30	60.2	0.8	58.74	.59	13.4	0.9
28.9	61.19	1.11	17.9	1.9	60.62	.38	9.4	0.3	41.97	.30	41.2	1.1	47.01	.31	61.0	0.9	59.33	.63	12.5	0.5
Aug. 7.8	62.30	1.22	16.0	1.3	61.00	.40	9.7	0.6	42.27	.31	42.3	1.0	47.32	.32	61.9	0.8	59.96	.66	12.0	0.2
17.8	63.52	1.28	14.7	0.8	61.40	.40	10.3	0.7	42.58	.32	43.3	0.9	47.64	.33	62.7	0.9	60.62	.68	11.8	0.1
27.8	64.80	1.31	13.9	0.2	61.80	.40	11.0	0.9	42.90	.31	44.2	0.9	47.97	.32	63.6	0.8	61.30	.68	11.9	0.5
Sept. 6.7	66.11	1.28	13.7	0.5	62.20	.38	11.9	1.0	43.21	.30	45.1	0.7	48.29	.32	64.4	0.8	61.98	.68	12.4	0.9
16.7	67.39	1.21	14.2	1.1	62.58	.38	12.9	1.1	43.51	.29	45.8	0.6	48.61	.30	65.2	0.7	62.66	.66	13.3	1.2
26.7	68.60	1.11	15.3	1.7	62.96	.36	14.0	1.3	43.80	.28	46.4	0.5	48.91	.30	65.9	0.6	63.32	.63	14.5	1.5
Oct. 6.7	69.71	0.96	17.0	2.2	63.32	.33	15.3	1.4	44.08	.26	46.9	0.3	49.21	.27	66.5	0.5	63.95	.60	16.0	1.7
16.6	70.67	0.78	19.2	2.6	63.65	.31	16.7	1.4	44.34	.24	47.2	0.2	49.48	.26	67.0	0.5	64.55	.55	17.7	2.1
26.6	71.45	0.57	21.8	2.9	63.96	.27	18.1	1.5	44.58	.22	47.4	0.1	49.74	.24	67.5	0.4	65.10	.50	19.8	2.3
Nov. 5.6	72.02	0.33	24.7	3.2	64.23	.24	19.6	1.5	44.80	.20	47.5	0.0	49.98	.20	67.9	0.4	65.60	.42	22.1	2.5
15.5	72.35	0.08	27.9	3.3	64.47	.20	21.1	1.5	45.00	.16	47.5	0.0	50.18	.18	68.3	0.3	66.02	.35	24.6	2.6
25.5	72.43	0.17	31.2	3.3	64.67	.15	22.6	1.5	45.16	.13	47.5	0.2	50.36	.14	68.6	0.2	66.37	.26	27.2	2.7
Dec. 5.5	72.26	0.42	34.5	3.1	64.82	.10	24.1	1.5	45.29	.08	47.3	0.1	50.50	.10	68.8	0.3	66.63	.16	29.9	2.7
15.5	71.84	0.66	37.6	2.9	64.92	.05	25.6	1.4	45.37	.05	47.2	0.2	50.60	.05	69.1	0.2	66.79	.06	32.6	2.6
25.4	71.18	0.87	40.5	2.6	64.97	.01	27.0	1.3	45.42	.01	47.0	0.2	50.65	.01	69.3	0.2	66.85	.05	35.2	2.5
35.4	70.31		43.1		64.96		28.3		45.43		46.8		50.66		69.5		66.80		37.7	

(CONSTANTS OF STRUVE AND PETERS.)

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	ι Tauri.				ι Aurigæ.				ζ Aurigæ.				11 Orionis.				β Eridani.			
	Right Ascension.		Declination North.		Right Ascension.		Declination North.		Right Ascension.		Declination North.		Right Ascension.		Declination North.		Right Ascension.		Declination South.	
	h m 4 46		° ′ +18 41		h m 4 51		° ′ +33 1		h m 4 56		° ′ +40 56		h m 4 59		° ′ +15 16		h m 5 3		° ′ – 5 11	
	s		″		s		″		s		″		s		″		s		″	
Jan. 0.4	3.06	.02	8.1	0.0	4.08	.01	23.9	0.7	7.12	.01	40.8	1.2	22.24	.00	40.3	0.2	22.82	.00	76.0	1.3
10.4	3.04	.05	8.1	0.1	4.07	.06	24.6	0.7	7.11	.07	42.0	1.0	22.24	.05	40.1	0.2	22.82	.05	77.3	1.1
20.4	2.99	.09	8.0	0.0	4.01	.11	25.3	0.5	7.04	.12	43.0	0.9	22.19	.08	39.9	0.2	22.77	.09	78.4	0.9
30.4	2.90	.13	8.0	0.1	3.90	.14	25.8	0.4	6.92	.16	43.9	0.6	22.11	.12	39.7	0.2	22.68	.12	79.3	0.8
Feb. 9.3	2.77	.15	7.9	0.1	3.76	.17	26.2	0.2	6.76	.19	44.5	0.4	21.99	.15	39.5	0.1	22.56	.15	80.1	0.5
19.3	2.62	.17	7.8	0.1	3.59	.20	26.4	0.0	6.57	.22	44.9	0.2	21.84	.16	39.4	0.1	22.41	.17	80.6	0.3
Mar. 1.3	2.45	.18	7.7	0.1	3.39	.20	26.4	0.2	6.35	.23	45.1	0.1	21.68	.18	39.3	0.1	22.24	.18	80.9	0.1
11.2	2.27	.18	7.6	0.2	3.19	.20	26.2	0.3	6.12	.23	45.0	0.3	21.50	.17	39.2	0.1	22.06	.17	81.0	0.2
21.2	2.09	.16	7.4	0.2	2.99	.19	25.9	0.4	5.89	.21	44.7	0.6	21.33	.16	39.1	0.0	21.89	.16	80.8	0.4
31.2	1.93	.13	7.2	0.1	2.80	.15	25.5	0.6	5.68	.18	44.1	0.8	21.17	.14	39.1	0.0	21.73	.15	80.4	0.6
Apr. 10.2	1.80	.10	7.1	0.1	2.65	.12	24.9	0.6	5.50	.14	43.3	0.9	21.03	.11	39.1	0.1	21.58	.12	79.8	0.8
20.1	1.70	.06	7.0	0.0	2.53	.08	24.3	0.7	5.36	.09	42.4	1.0	20.92	.07	39.2	0.1	21.46	.08	79.0	1.0
30.1	1.64	.02	7.0	0.1	2.45	.02	23.6	0.7	5.27	.03	41.4	1.0	20.85	.03	39.3	0.2	21.38	.04	78.0	1.3
May 10.1	1.62	.03	7.1	0.1	2.43	.03	22.9	0.6	5.24	.02	40.4	1.1	20.82	.02	39.5	0.4	21.34	.00	76.7	1.4
20.1	1.65	.08	7.2	0.3	2.46	.08	22.3	0.6	5.26	.08	39.3	1.0	20.84	.06	39.9	0.5	21.34	.05	75.3	1.6
30.0	1.73	.13	7.5	0.5	2.54	.13	21.7	0.4	5.34	.13	38.3	0.9	20.90	.11	40.4	0.6	21.39	.08	73.7	1.7
June 9.0	1.86	.16	8.0	0.5	2.67	.18	21.3	0.3	5.47	.19	37.4	0.8	21.01	.15	41.0	0.7	21.47	.13	72.0	1.8
19.0	2.02	.21	8.5	0.7	2.85	.22	21.0	0.2	5.66	.24	36.6	0.6	21.16	.19	41.7	0.8	21.60	.17	70.2	1.9
28.9	2.23	.23	9.2	0.8	3.07	.26	20.8	0.0	5.90	.28	36.0	0.4	21.35	.22	42.5	0.8	21.77	20	68.3	1.9
July 8.9	2.46	.27	10.0	0.8	3.33	.30	20.8	0.2	6.18	.31	35.6	0.3	21.57	.25	43.3	1.0	21.97	.23	66.4	1.9
18.9	2.73	.28	10.8	0.9	3.63	.31	21.0	0.3	6.49	.34	35.3	0.1	21.82	.27	44.3	0.9	22.20	.25	64.5	1.7
28.9	3.01	.30	11.7	0.9	3.94	.34	21.3	0.4	6.83	.36	35.2	0.1	22.09	.29	45.2	1.0	22.45	.27	62.8	1.6
Aug. 7.8	3.31	.31	12.6	0.9	4.28	.34	21.7	0.5	7.19	.38	35.3	0.3	22.38	.30	46.2	0.9	22.72	.28	61.2	1.3
17.8	3.62	.32	13.5	0.8	4.62	.35	22.2	0.6	7.57	.39	35.6	0.4	22.68	.31	47.1	0.8	23.00	.29	59.9	1.1
27.8	3.94	.31	14.3	0.8	4.97	.36	22.8	0.6	7.96	.39	36.0	0.5	22.99	.31	47.9	0.7	23.29	.29	58.8	0.8
Sept. 6.8	4.25	.32	15.1	0.7	5.33	.35	23.4	0.7	8.35	.38	36.5	0.7	23.30	.30	48.6	0.6	23.58	.29	58.0	0.5
16.7	4.57	.30	15.8	0.6	5.68	.34	24.1	0.8	8.73	.38	37.2	0.8	23.60	.30	49.2	0.4	23.87	.29	57.5	0.2
26.7	4.87	.29	16.4	0.4	6.02	.33	24.9	0.8	9.11	.37	38.0	0.9	23.90	.29	49.6	0.3	24.16	.27	57.3	0.2
Oct. 6.7	5.16	.27	16.8	0.3	6.35	.31	25.7	0.8	9.48	.35	38.9	1.0	24.19	.28	49.9	0.1	24.43	.27	57.5	0.6
16.6	5.43	.26	17.1	0.3	6.66	.30	26.5	0.8	9.83	.33	39.9	1.1	24.47	.26	50.0	0.0	24.70	.24	58.1	0.8
26.6	5.69	.24	17.4	0.1	6.96	.27	27.3	0.8	10.16	.30	41.0	1.2	24.73	.24	50.0	0.1	24.94	.23	58.9	1.1
Nov. 5.6	5.93	.21	17.5	0.1	7.23	.24	28.1	0.8	10.46	.27	42.2	1.2	24.97	.22	49.9	0.2	25.17	.20	60.0	1.3
15.6	6.14	.18	17.6	0.0	7.47	.21	28.9	0.9	10.73	.23	43.4	1.3	25.19	.19	49.7	0.2	25.37	.18	61.3	1.4
25.5	6.32	.14	17.6	0.0	7.68	.17	29.8	0.8	10.96	.19	44.7	1.3	25.38	.16	49.5	0.3	25.55	.14	62.7	1.5
Dec. 5.5	6.46	.11	17.6	0.1	7.85	.12	30.6	0.9	11.15	.14	46.0	1.3	25.54	.11	49.2	0.3	25.69	.10	64.2	1.6
15.5	6.57	.06	17.5	0.0	7.97	.07	31.5	0.8	11.29	.08	47.3	1.3	25.65	.08	48.9	0.3	25.79	.07	65.8	1.4
25.5	6.63	.02	17.5	0.1	8.04	.03	32.3	0.8	11.37	.03	48.6	1.2	25.73	.03	48.6	0.2	25.86	.02	67.2	1.4
35.4	6.65		17.4		8.07		33.1		11.40		49.8		25.76		48.4		25.88		68.6	

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	*α* Aurigæ. (*Capella.*)				*β* Orionis. (*Rigel.*)				*τ* Orionis.				*β* Tauri.				*χ* Aurigæ.			
	Right Ascension.		Declination *North.*		Right Ascension.		Declination *South.*		Right Ascension.		Declination *South.*		Right Ascension.		Declination *North.*		Right Ascension.		Declination *North.*	
	h m 5 9 s		° ′ +45 54 ″		h m 5 10 s		° ′ − 8 18 ″		h m 5 13 s		° ′ − 6 56 ″		h m 5 20 s		° ′ +28 31 ″		h m 5 26 s		° ′ +32 7 ″	
Jan. 0.4	58.22	.00	25.9	1.5	10.15	.00	25.9	1.5	11.56	.00	35.1	1.4	32.51	.02	53.8	0.5	48.47	.03	32.9	0.7
10.4	58.22	.06	27.4	1.3	10.15	.05	27.4	1.2	11.56	.04	36.5	1.3	32.53	.03	54.3	0.5	48.50	.02	33.6	0.7
20.4	58.16	.12	28.7	1.1	10.10	.09	28.6	1.1	11.52	.09	37.8	1.0	32.50	.07	54.8	0.4	48.48	.08	34.3	0.7
30.4	58.04	.17	29.8	0.9	10.01	.12	29.7	0.9	11.43	.12	38.8	0.8	32.43	.12	55.2	0.4	48.40	.12	35.0	0.5
Feb. 9.3	57.87	.21	30.7	0.7	9.89	.15	30.6	0.6	11.31	.14	39.6	0.6	32.31	.15	55.6	0.3	48.28	.15	35.5	0.4
19.3	57.66	.24	31.4	0.3	9.74	.17	31.2	0.3	11.17	.17	40.2	0.4	32.16	.18	55.9	0.1	48.13	.19	35.9	0.2
Mar. 1.3	57.42	.25	31.7	0.0	9.57	.18	31.5	0.1	11.00	.18	40.6	0.1	31.98	.20	56.0	0.0	47.94	.20	36.1	0.1
11.3	57.17	.25	31.7	0.2	9.39	.18	31.6	0.2	10.82	.18	40.7	0.2	31.78	.19	56.0	0.1	47.74	.20	36.2	0.0
21.2	56.92	.23	31.5	0.6	9.21	.17	31.4	0.4	10.64	.17	40.5	0.4	31.59	.19	55.9	0.2	47.54	.19	36.2	0.2
31.2	56.69	.21	30.9	0.8	9.04	.15	31.0	0.7	10.47	.15	40.1	0.6	31.40	.16	55.7	0.3	47.35	.17	36.0	0.4
Apr. 10.2	56.48	.17	30.1	1.0	8.89	.12	30.3	0.9	10.32	.12	39.5	0.8	31.24	.13	55.4	0.3	47.18	.15	35.6	0.4
20.1	56.31	.11	29.1	1.1	8.77	.09	29.4	1.1	10.20	.09	38.7	1.1	31.11	.09	55.1	0.4	47.03	.10	35.2	0.6
30.1	56.20	.06	28.0	1.3	8.68	.05	28.3	1.4	10.11	.05	37.6	1.3	31.02	.05	54.7	0.4	46.93	.06	34.6	0.5
May 10.1	56.14	.00	26.7	1.3	8.63	.01	26.9	1.5	10.06	.01	36.3	1.5	30.97	.00	54.3	0.4	46.87	.00	34.1	0.6
20.1	56.14	.06	25.4	1.3	8.62	.04	25.4	1.7	10.05	.03	34.8	1.6	30.97	.05	53.9	0.3	46.87	.04	33.5	0.5
30.0	56.20	.13	24.1	1.2	8.66	.08	23.7	1.9	10.08	.08	33.2	1.8	31.02	.09	53.6	0.3	46.91	.09	33.0	0.5
June 9.0	56.33	.18	22.9	1.1	8.74	.12	21.8	2.0	10.16	.12	31.4	1.9	31.11	.15	53.3	0.1	47.00	.14	32.5	0.4
19.0	56.51	.24	21.8	1.0	8.86	.16	19.8	2.0	10.28	.16	29.5	2.0	31.26	.18	53.2	0.1	47.14	.19	32.1	0.3
29.0	56.75	.28	20.8	0.8	9.02	.19	17.8	2.0	10.44	.19	27.5	1.9	31.44	.23	53.1	0.0	47.33	.23	31.8	0.1
July 8.9	57.03	.32	20.0	0.6	9.21	.22	15.8	2.0	10.63	.22	25.6	1.9	31.67	.26	53.1	0.2	47.56	.26	31.7	0.1
18.9	57.35	.36	19.4	0.5	9.43	.25	13.8	1.8	10.85	.25	23.7	1.8	31.93	.28	53.3	0.2	47.82	.29	31.6	0.1
28.9	57.71	.38	18.9	0.2	9.68	.26	12.0	1.7	11.10	.26	21.9	1.6	32.21	.31	53.5	0.4	48.11	.31	31.7	0.1
Aug. 7.8	58.09	.40	18.7	0.0	9.94	.28	10.3	1.4	11.36	.28	20.3	1.4	32.52	.32	53.9	0.3	48.42	.33	31.8	0.2
17.8	58.49	.41	18.7	0.1	10.22	.29	8.9	1.2	11.64	.28	18.9	1.1	32.84	.33	54.2	0.4	48.75	.34	32.0	0.3
27.8	58.90	.42	18.8	0.3	10.51	.29	7.7	0.8	11.92	.29	17.8	0.8	33.17	.33	54.6	0.5	49.09	.34	32.3	0.3
Sept. 6.8	59.32	.42	19.1	0.5	10.80	.29	6.9	0.5	12.21	.29	17.0	0.5	33.50	.34	55.1	0.4	49.43	.35	32.6	0.4
16.7	59.74	.41	19.6	0.7	11.09	.29	6.4	0.1	12.50	.29	16.5	0.1	33.84	.34	55.5	0.4	49.78	.35	33.0	0.4
26.7	60.15	.40	20.3	0.8	11.38	.28	6.3	0.3	12.79	.28	16.4	0.2	34.18	.32	55.9	0.5	50.13	.34	33.4	0.4
Oct. 6.7	60.55	.39	21.1	1.0	11.66	.27	6.6	0.6	13.07	.27	16.6	0.6	34.50	.32	56.4	0.4	50.47	.34	33.8	0.4
16.7	60.94	.37	22.1	1.1	11.93	.25	7.2	1.0	13.34	.25	17.2	0.9	34.82	.31	56.8	0.4	50.81	.32	34.2	0.5
26.6	61.31	.34	23.2	1.3	12.18	.23	8.2	1.2	13.59	.24	18.1	1.2	35.13	.28	57.2	0.4	51.13	.30	34.7	0.5
Nov. 5.6	61.65	.30	24.5	1.3	12.41	.21	9.4	1.5	13.83	.21	19.3	1.4	35.41	.26	57.6	0.4	51.43	.27	35.2	0.6
15.6	61.95	.27	25.8	1.5	12.62	.18	10.9	1.6	14.04	.18	20.7	1.5	35.67	.23	58.0	0.4	51.70	.24	35.8	0.6
25.5	62.22	.22	27.3	1.5	12.80	.14	12.5	1.7	14.22	.15	22.2	1.6	35.90	.20	58.4	0.4	51.94	.21	36.4	0.6
Dec. 5.5	62.44	.16	28.8	1.6	12.94	.11	14.2	1.7	14.37	.11	23.8	1.7	36.10	.15	58.8	0.5	52.15	.17	37.0	0.7
15.5	62.60	.11	30.4	1.5	13.05	.06	15.9	1.7	14.48	.07	25.5	1.6	36.25	.11	59.3	0.5	52.32	.11	37.7	0.7
25.5	62.71	.04	31.9	1.5	13.11	.03	17.6	1.5	14.55	.03	27.1	1.5	36.36	.05	59.8	0.5	52.43	.07	38.4	0.7
35.4	62.75		33.4		13.14		19.1		14.58		28.6		36.41		60.3		52.50		39.1	

(CONSTANTS OF STRUVE AND PETERS.)

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	δ Orionis.				Groombridge 966.				α Leporis.				ε Orionis.				Groombridge 944.			
	Right Ascension.		Declination *South*.		Right Ascension.		Declination *North*.		Right Ascension.		Declination *South*.		Right Ascension.		Declination *South*.		Right Ascension.		Declination *North*.	
	h m 5 27		° ′ − 0 21		h m 5 27		° ′ +74 58		h m 5 28		° ′ −17 52		h m 5 31		° ′ − 1 15		h m 5 32		° ′ +85 8	
	s		″		s		″		s		″		s		″		s		″	
Jan. 0.5	21.70	.02	59.4	1.1	35.35	0.08	71.0	2.8	43.48	.00	76.7	2.0	36.02	.02	35.9	1.2	51.99	0.39	77.2	3.2
10.4	21.72	.03	60.5	1.0	35.27	0.24	73.8	2.7	43.48	.05	78.7	1.8	36.04	.02	37.1	1.1	51.60	0.88	80.4	3.0
20.4	21.69	.07	61.5	0.8	35.03	0.40	76.5	2.3	43.43	.09	80.5	1.4	36.02	.07	38.2	0.8	50.72	1.34	83.4	2.7
30.4	21.62	.10	62.3	0.7	34.63	0.52	78.8	2.0	43.34	.12	81.9	1.2	35.95	.11	39.0	0.7	49.38	1.74	86.1	2.2
Feb. 9.3	21.52	.14	63.0	0.4	34.11	0.64	80.8	1.5	43.22	.16	83.1	0.9	35.84	.13	39.7	0.6	47.64	2.06	88.3	1.7
19.3	21.38	.16	63.4	0.3	33.47	0.71	82.3	1.0	43.06	.18	84.0	0.6	35.71	.16	40.3	0.3	45.58	2.29	90.0	1.2
Mar. 1.3	21.22	.17	63.7	0.2	32.76	0.75	83.3	0.4	42.88	.19	84.6	0.2	35.55	.17	40.6	0.1	43.29	2.41	91.2	0.6
11.3	21.05	.18	63.9	0.1	32.01	0.75	83.7	0.1	42.69	.20	84.8	0.2	35.38	.18	40.7	0.1	40.88	2.43	91.8	0.0
21.2	20.87	.17	63.8	0.2	31.26	0.73	83.6	0.6	42.49	.19	84.6	0.5	35.20	.17	40.6	0.2	38.45	2.36	91.8	0.6
31.2	20.70	.15	63.6	0.5	30.53	0.66	83.0	1.2	42.30	.17	84.1	0.8	35.03	.15	40.4	0.4	36.09	2.18	91.2	1.2
Apr. 10.2	20.55	.12	63.1	0.6	29.87	0.57	81.8	1.6	42.13	.14	83.3	1.1	34.88	.13	40.0	0.7	33.91	1.91	90.0	1.7
20.2	20.43	.10	62.5	0.8	29.30	0.46	80.2	1.9	41.99	.12	82.2	1.4	34.75	.10	39.3	0.8	32.00	1.58	88.3	2.1
30.1	20.33	.05	61.7	0.9	28.84	0.31	78.3	2.2	41.87	.07	80.8	1.6	34.65	.06	38.5	1.0	30.42	1.18	86.2	2.4
May 10.1	20.28	.02	60.8	1.1	28.53	0.17	76.1	2.5	41.80	.04	79.2	1.9	34.59	.02	37.5	1.1	29.24	0.75	83.8	2.7
20.1	20.26	.03	59.7	1.3	28.36	0.02	73.6	2.5	41.76	.01	77.3	2.1	34.57	.03	36.4	1.3	28.49	0.29	81.1	2.8
30.0	20.29	.07	58.4	1.4	28.34	0.14	71.1	2.6	41.77	.05	75.2	2.3	34.60	.06	35.1	1.4	28.20	0.17	78.3	2.9
June 9.0	20.36	.11	57.0	1.5	28.48	0.29	68.5	2.5	41.82	.10	72.9	2.4	34.66	.11	33.7	1.6	28.37	0.63	75.4	2.9
19.0	20.47	.15	55.5	1.6	28.77	0.43	66.0	2.4	41.92	.13	70.5	2.4	34.77	.15	32.1	1.6	29.00	1.07	72.5	2.8
29.0	20.62	.18	53.9	1.6	29.20	0.57	63.6	2.2	42.05	.17	68.1	2.4	34.92	.18	30.5	1.6	30.07	1.49	69.7	2.6
July 8.9	20.80	.22	52.3	1.5	29.77	0.69	61.4	2.0	42.22	.21	65.7	2.3	35.10	.21	28.9	1.6	31.56	1.86	67.1	2.3
18.9	21.02	.24	50.8	1.5	30.46	0.78	59.4	1.7	42.43	.23	63.4	2.2	35.31	.23	27.3	1.5	33.42	2.19	64.8	2.0
28.9	21.26	.26	49.3	1.4	31.24	0.88	57.7	1.4	42.66	.26	61.2	1.9	35.54	.26	25.8	1.4	35.61	2.48	62.8	1.7
Aug. 7.9	21.52	.27	47.9	1.2	32.12	0.94	56.3	1.0	42.92	.27	59.3	1.7	35.80	.27	24.4	1.3	38.09	2.71	61.1	1.3
17.8	21.79	.28	46.7	1.0	33.06	0.99	55.3	0.6	43.19	.28	57.6	1.3	36.07	.28	23.1	1.0	40.80	2.89	59.8	0.9
27.8	22.07	.29	45.7	0.8	34.05	1.03	54.7	0.2	43.47	.29	56.3	0.9	36.35	.29	22.1	0.7	43.69	3.01	58.9	0.4
Sept. 6.8	22.36	.29	44.9	0.5	35.08	1.05	54.5	0.1	43.76	.30	55.4	0.5	36.64	.29	21.4	0.5	46.70	3.09	58.5	0.0
16.7	22.65	.29	44.4	0.1	36.13	1.04	54.6	0.6	44.06	.29	54.9	0.0	36.93	.29	20.9	0.2	49.79	3.09	58.5	0.5
26.7	22.94	.29	44.3	0.1	37.17	1.03	55.2	0.9	44.35	.29	54.9	0.4	37.22	.28	20.7	0.2	52.88	3.04	59.0	0.9
Oct. 6.7	23.23	.27	44.4	0.4	38.20	0.99	56.1	1.4	44.64	.28	55.3	0.8	37.50	.28	20.9	0.5	55.92	2.93	59.9	1.4
16.7	23.50	.27	44.8	0.7	39.19	0.93	57.5	1.7	44.92	.27	56.1	1.3	37.78	.27	21.4	0.7	58.85	2.75	61.3	1.8
26.6	23.77	.25	45.5	1.0	40.12	0.85	59.2	2.0	45.19	.24	57.4	1.6	38.05	.25	22.1	1.0	61.60	2.51	63.1	2.2
Nov. 5.6	24.02	.22	46.5	1.1	40.97	0.76	61.2	2.4	45.43	.22	59.0	1.9	38.30	.23	23.1	1.1	64.11	2.21	65.3	2.6
15.6	24.24	.20	47.6	1.2	41.73	0.65	63.6	2.6	45.65	.19	60.9	2.1	38.53	.20	24.2	1.3	66.32	1.84	67.9	2.9
25.6	24.44	.17	48.8	1.3	42.38	0.51	66.2	2.8	45.84	.16	63.0	2.2	38.73	.17	25.5	1.4	68.16	1.43	70.8	3.1
Dec. 5.5	24.61	.13	50.1	1.3	42.89	0.36	69.0	3.0	46.00	.12	65.2	2.2	38.90	.13	26.9	1.4	69.59	0.96	73.9	3.2
15.5	24.74	.09	51.4	1.3	43.25	0.20	72.0	3.0	46.12	.07	67.4	2.2	39.03	.10	28.3	1.3	70.55	0.47	77.1	3.4
25.5	24.83	.05	52.7	1.2	43.45	0.04	75.0	2.9	46.19	.03	69.6	2.1	39.13	.05	29.6	1.3	71.02	0.05	80.5	3.3
35.4	24.88		53.9		43.49		77.9		46.22		71.7		39.18		30.9		70.97		83.8	

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Columbæ.				κ Orionis.				δ Doradus.				ν Aurigæ.				α Orionis.			
	Right Ascension.		Declination *South*.		Right Ascension.		Declination *South*.		Right Ascension.		Declination *South*.		Right Ascension.		Declination *North*.		Right Ascension.		Declination *North*.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	5 36		−34 6		5 43		− 9 41		5 44		−65 45		5 45		+39 7		5 50		+ 7 23	
	s		″		s		″		s		″		s		″		s		″	
Jan. 0.5	22.09	.02	84.6	2.6	26.82	.02	67.4	1.7	39.69	.19	75.7	3.2	11.27	.05	23.1	1.2	14.97	.04	25.8	0.8
10.4	22.07	.08	87.2	2.4	26.84	.02	69.1	1.5	39.50	.28	78.9	2.9	11.32	.01	24.3	1.1	15.01	.01	25.0	0.7
20.4	21.99	.12	89.6	2.0	26.82	.06	70.6	1.2	39.22	.36	81.8	2.5	11.31	.07	25.4	1.0	15.00	.05	24.3	0.5
30.4	21.87	.16	91.6	1.7	26.76	.11	71.8	1.0	38.86	.43	84.3	2.0	11.24	.12	26.4	0.9	14.95	.09	23.8	0.4
Feb. 9.4	21.71	.20	93.3	1.2	26.65	.14	72.8	0.8	38.43	.50	86.3	1.5	11.12	.16	27.3	0.7	14.86	.12	23.4	0.3
19.3	21.51	.22	94.5	0.8	26.51	.16	73.6	0.5	37.93	.54	87.8	1.0	10.96	.20	28.0	0.5	14.74	.15	23.1	0.2
Mar. 1.3	21.29	.24	95.3	0.3	26.35	.18	74.1	0.2	37.39	.57	88.8	0.5	10.76	.21	28.5	0.3	14.59	.16	22.9	0.0
11.3	21.05	.24	95.6	0.2	26.17	.18	74.3	0.0	36.82	.57	89.3	0.1	10.55	.22	28.8	0.1	14.43	.18	22.9	0.0
21.2	20.81	.24	95.4	0.6	25.99	.18	74.3	0.3	36.25	.56	89.2	0.6	10.33	.22	28.9	0.2	14.25	.17	22.9	0.2
31.2	20.57	.21	94.8	1.0	25.81	.17	74.0	0.6	35.69	.53	88.6	1.2	10.11	.20	28.7	0.4	14.08	.16	23.1	0.2
Apr. 10.2	20.36	.19	93.8	1.4	25.64	.14	73.4	0.8	35.16	.49	87.4	1.6	9.91	.17	28.3	0.5	13.92	.13	23.3	0.4
20.2	20.17	.16	92.4	1.8	25.50	.11	72.6	1.0	34.67	.44	85.8	2.1	9.74	.13	27.8	0.7	13.79	.11	23.7	0.4
30.1	20.01	.12	90.6	2.1	25.39	.07	71.6	1.3	34.23	.37	83.7	2.5	9.61	.08	27.1	0.8	13.68	.06	24.1	0.6
May 10.1	19.89	.07	88.5	2.4	25.32	.04	70.3	1.5	33.86	.30	81.2	2.9	9.53	.03	26.3	0.9	13.62	.03	24.7	0.7
20.1	19.82	.03	86.1	2.7	25.28	.00	68.8	1.7	33.56	.21	78.3	3.1	9.50	.02	25.4	0.9	13.59	.01	25.4	0.8
30.1	19.79	.02	83.4	2.8	25.28	.05	67.1	1.8	33.35	.12	75.2	3.3	9.52	.08	24.5	0.9	13.60	.05	26.2	0.9
June 9.0	19.81	.07	80.6	3.0	25.33	.09	65.3	2.0	33.23	.03	71.9	3.5	9.60	.13	23.6	0.9	13.65	.10	27.1	1.0
19.0	19.88	.12	77.6	3.0	25.42	.13	63.3	2.0	33.20	.06	68.4	3.5	9.73	.18	22.7	0.7	13.75	.14	28.1	1.1
29.0	20.00	.15	74.6	3.0	25.55	.16	61.3	2.0	33.26	.16	64.9	3.5	9.91	.22	22.0	0.7	13.89	.17	29.2	1.1
July 8.9	20.15	.20	71.6	2.8	25.71	.20	59.3	1.9	33.42	.24	61.4	3.3	10.13	.26	21.3	0.6	14.06	.20	30.3	1.1
18.9	20.35	.24	68.8	2.7	25.91	.22	57.4	1.9	33.66	.31	58.1	3.1	10.39	.30	20.7	0.4	14.26	.23	31.4	1.1
28.9	20.59	.26	66.1	2.4	26.13	.24	55.5	1.7	33.97	.39	55.0	2.8	10.69	.32	20.3	0.3	14.49	.25	32.5	1.0
Aug. 7.9	20.85	.28	63.7	2.0	26.37	.26	53.8	1.4	34.36	.46	52.2	2.3	11.01	.35	20.0	0.2	14.74	.27	33.5	0.9
17.8	21.13	.30	61.7	1.5	26.63	.28	52.4	1.2	34.82	.50	49.9	1.8	11.36	.36	19.8	0.1	15.01	.28	34.4	0.7
27.8	21.43	.32	60.2	1.1	26.91	.29	51.2	0.9	35.32	.54	48.1	1.2	11.72	.37	19.7	0.1	15.29	.29	35.1	0.6
Sept. 6.8	21.75	.32	59.1	0.6	27.20	.29	50.3	0.5	35.86	.56	46.9	0.6	12.09	.38	19.8	0.1	15.58	.29	35.7	0.4
16.8	22.07	.33	58.5	0.1	27.49	.29	49.8	0.1	36.42	.57	46.3	0.0	12.47	.38	19.9	0.3	15.87	.30	36.1	0.1
26.7	22.40	.31	58.6	0.6	27.78	.29	49.7	0.3	36.99	.55	46.3	0.7	12.85	.37	20.2	0.3	16.17	.30	36.2	0.1
Oct. 6.7	22.71	.31	59.2	1.1	28.07	.28	50.0	0.7	37.54	.53	47.0	1.3	13.22	.37	20.5	0.4	16.47	.29	36.1	0.3
16.7	23.02	.29	60.3	1.6	28.35	.27	50.7	1.0	38.07	.49	48.3	1.9	13.59	.36	20.9	0.6	16.76	.28	35.8	0.5
26.6	23.31	.26	61.9	2.1	28.62	.25	51.7	1.3	38.56	.44	50.2	2.4	13.95	.34	21.5	0.6	17.04	.27	35.3	0.7
Nov. 5.6	23.57	.24	64.0	2.4	28.87	.23	53.0	1.5	39.00	.36	52.6	2.9	14.29	.32	22.1	0.7	17.31	.25	34.6	0.8
15.6	23.81	.20	66.4	2.7	29.10	.21	54.5	1.8	39.36	.28	55.5	3.2	14.61	.28	22.8	0.9	17.56	.23	33.8	0.9
25.6	24.01	.15	69.1	2.9	29.31	.18	56.3	1.8	39.64	.18	58.7	3.5	14.89	.24	23.7	0.9	17.79	.19	32.9	0.9
Dec. 5.5	24.16	.11	72.0	2.9	29.49	.13	58.1	1.9	39.82	.08	62.2	3.5	15.13	.20	24.6	1.0	17.98	.16	32.0	1.0
15.5	24.27	.07	74.9	2.9	29.62	.10	60.0	1.9	39.90	.02	65.7	3.5	15.33	.15	25.6	1.1	18.14	.12	31.0	0.9
25.5	24.34	.01	77.8	2.8	29.72	.06	61.9	1.7	39.88	.12	69.2	3.4	15.48	.09	26.7	1.2	18.26	.08	30.1	0.8
35.5	24.35		80.6		29.78		63.6		39.76		72.6		15.57		27.9		18.34		29.3	

(CONSTANTS OF STRUVE AND PETERS.)

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	β Aurigæ.				θ Aurigæ.				ν Orionis.				22 Camelop. (H.).				η Geminorum.			
	Right Ascension.		Declination *North.*		Right Ascension.		Declination *North.*		Right Ascension.		Declination *North.*		Right Ascension.		Declination *North.*		Right Ascension.		Declination *North.*	
	h m 5 52		° ′ +44 56		h m 5 53		° ′ +37 12		h m 6 2		° ′ +14 46		h m 6 8		° ′ +69 20		h m 6 9		° ′ +22 32	
	s		″		s		″		s		″		s		″		s		″	
Jan. 0.5	51.67	.06	22.4	1.5	31.27	.06	26.3	1.0	22.85	.06	47.6	0.3	50.91	.08	73.3	2.7	23.37	.07	2.0	0.1
10.4	51.73	.00	23.9	1.4	31.33	.00	27.3	1.0	22.91	.01	47.3	0.3	50.99	.04	76.0	2.6	23.44	.02	2.1	0.2
20.4	51.73	.07	25.3	1.3	31.33	.05	28.3	1.0	22.92	.04	47.0	0.1	50.95	.17	78.6	2.5	23.46	.03	2.3	0.3
30.4	51.66	.13	26.6	1.2	31.28	.11	29.3	0.8	22.88	.08	46.9	0.1	50.78	.29	81.1	2.1	23.43	.07	2.6	0.2
Feb. 9.4	51.53	.18	27.8	0.9	31.17	.15	30.1	0.7	22.80	.11	46.8	0.1	50.49	.38	83.2	1.8	23.36	.12	2.8	0.3
19.3	51.35	.21	28.7	0.7	31.02	.19	30.8	0.6	22.69	.15	46.7	0.0	50.11	.45	85.0	1.4	23.24	.15	3.1	0.2
Mar. 1.3	51.14	.24	29.4	0.4	30.83	.20	31.4	0.3	22.54	.17	46.7	0.1	49.66	.51	86.4	0.9	23.09	.17	3.3	0.2
11.3	50.90	.25	29.8	0.2	30.63	.22	31.7	0.1	22.37	.17	46.8	0.1	49.15	.54	87.3	0.4	22.92	.19	3.5	0.2
21.3	50.65	.24	30.0	0.2	30.41	.21	31.8	0.1	22.20	.18	46.9	0.1	48.61	.53	87.7	0.1	22.73	.18	3.7	0.1
31.2	50.41	.22	29.8	0.4	30.20	.20	31.7	0.3	22.02	.16	47.0	0.1	48.08	.51	87.6	0.6	22.55	.17	3.8	0.0
Apr. 10.2	50.19	.20	29.4	0.6	30.00	.17	31.4	0.4	21.86	.14	47.1	0.2	47.57	.46	87.0	1.0	22.38	.15	3.8	0.0
20.2	49.99	.15	28.8	0.9	29.83	.13	31.0	0.6	21.72	.11	47.3	0.2	47.11	.38	86.0	1.4	22.23	.12	3.8	0.1
30.1	49.84	.10	27.9	1.0	29.70	.09	30.4	0.7	21.61	.08	47.5	0.2	46.73	.30	84.6	1.8	22.11	.08	3.7	0.0
May 10.1	49.74	.05	26.9	1.1	29.61	.03	29.7	0.8	21.53	.04	47.7	0.4	46.43	.19	82.8	2.1	22.03	.04	3.7	0.0
20.1	49.69	.01	25.8	1.2	29.58	.01	28.9	0.8	21.49	.01	48.1	0.4	46.24	.09	80.7	2.2	21.99	.00	3.7	0.1
30.1	49.70	.07	24.6	1.2	29.59	.07	28.1	0.8	21.50	.05	48.5	0.4	46.15	.02	78.5	2.3	21.99	.04	3.6	0.1
June 9.0	49.77	.13	23.4	1.2	29.66	.12	27.3	0.7	21.55	.09	48.9	0.6	46.17	.14	76.2	2.4	22.03	.09	3.7	0.0
19.0	49.90	.18	22.2	1.2	29.78	.16	26.6	0.7	21.64	.13	49.5	0.6	46.31	.24	73.8	2.4	22.12	.14	3.7	0.1
29.0	50.08	.23	21.0	1.0	29.94	.21	25.9	0.6	21.77	.17	50.1	0.6	46.55	.35	71.4	2.3	22.26	.17	3.8	0.2
July 9.0	50.31	.28	20.0	0.9	30.15	.25	25.3	0.5	21.94	.20	50.7	0.7	46.90	.44	69.1	2.1	22.43	.20	4.0	0.2
18.9	50.59	.31	19.1	0.8	30.40	.29	24.8	0.4	22.14	.23	51.4	0.7	47.34	.52	67.0	2.0	22.63	.23	4.2	0.3
28.9	50.90	.34	18.3	0.6	30.69	.31	24.4	0.3	22.37	.25	52.1	0.6	47.86	.60	65.0	1.7	22.86	.26	4.5	0.2
Aug. 7.9	51.24	.37	17.7	0.4	31.00	.33	24.1	0.2	22.62	.27	52.7	0.6	48.46	.66	63.3	1.4	23.12	.27	4.7	0.2
17.8	51.61	.39	17.3	0.3	31.33	.35	23.9	0.1	22.89	.28	53.3	0.5	49.12	.70	61.9	1.1	23.39	.30	4.9	0.2
27.8	52.00	.40	17.0	0.2	31.68	.36	23.8	0.0	23.17	.30	53.8	0.3	49.82	.75	60.8	0.8	23.69	.31	5.1	0.2
Sept. 6.8	52.40	.41	16.8	0.0	32.04	.37	23.8	0.0	23.47	.30	54.1	0.3	50.57	.77	60.0	0.5	24.00	.32	5.3	0.1
16.8	52.81	.41	16.8	0.1	32.41	.37	23.8	0.1	23.77	.31	54.4	0.0	51.34	.79	59.5	0.1	24.32	.32	5.4	0.0
26.7	53.22	.42	16.9	0.3	32.78	.37	23.9	0.2	24.08	.31	54.4	0.0	52.13	.79	59.4	0.3	24.64	.33	5.4	0.1
Oct. 6.7	53.64	.40	17.2	0.5	33.15	.36	24.1	0.3	24.39	.30	54.4	0.2	52.92	.78	59.7	0.6	24.97	.32	5.3	0.1
16.7	54.04	.40	17.7	0.6	33.51	.36	24.4	0.4	24.69	.30	54.2	0.4	53.70	.76	60.3	1.0	25.29	.31	5.2	0.2
26.7	54.44	.37	18.3	0.8	33.87	.34	24.8	0.5	24.99	.29	53.8	0.5	54.46	.72	61.3	1.3	25.60	.31	5.0	0.2
Nov. 5.6	54.81	.35	19.1	0.9	34.21	.31	25.3	0.6	25.28	.27	53.3	0.5	55.18	.66	62.6	1.7	25.91	.29	4.8	0.2
15.6	55.16	.32	20.0	1.1	34.52	.29	25.9	0.7	25.55	.24	52.8	0.6	55.84	.59	64.3	2.0	26.20	.26	4.6	0.2
25.6	55.48	.27	21.1	1.2	34.81	.25	26.6	0.7	25.79	.21	52.2	0.5	56.43	.51	66.3	2.3	26.46	.23	4.4	0.2
Dec. 5.5	55.75	.22	22.3	1.4	35.06	.20	27.3	0.9	26.00	.18	51.7	0.5	56.94	.41	68.6	2.5	26.69	.20	4.2	0.1
15.5	55.97	.16	23.7	1.4	35.26	.16	28.2	1.0	26.18	.14	51.2	0.5	57.35	.29	71.1	2.6	26.89	.15	4.1	0.0
25.5	56.13	.11	25.1	1.5	35.42	.10	29.2	1.0	26.32	.09	50.7	0.4	57.64	.17	73.7	2.7	27.04	.11	4.1	0.1
35.5	56.24		26.6		35.52		30.2		26.41		50.3		57.81		76.4		27.15		4.2	

(CONSTANTS OF STRUVE AND PETERS.)

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	*μ* Geminorum.				*ψ*¹ Aurigæ.				*α* Argûs. (*Canopus.*)				*ν* Geminorum.				*γ* Geminorum.			
	Right Ascension.		Declination *North.*		Right Ascension.		Declination *North.*		Right Ascension.		Declination *South.*		Right Ascension.		Declination *North.*		Right Ascension.		Declination *North.*	
	h m 6 17		° ′ +22 33		h m 6 17		° ′ +49 20		h m 6 21		° ′ −52 38		h m 6 23		° ′ +20 16		h m 6 32		° ′ +16 28	
	s		″		s		″		s		″		s		″		s		″	
Jan. 0.5	27.60	.08	39.8	0.1	54.08	.09	8.0	1.7	57.70	.02	45.7	3.4	33.87	.08	13.6	0.0	27.60	.09	39.3	0.3
10.5	27.68	.03	39.9	0.2	54.17	.02	9.7	1.7	57.68	.10	49.1	3.1	33.95	.03	13.6	0.0	27.69	.04	39.0	0.2
20.4	27.71	.02	40.1	0.2	54.19	.04	11.4	1.6	57.58	.16	52.2	2.8	33.98	.02	13.6	0.1	27.73	.01	38.8	0.1
30.4	27.69	.07	40.3	0.3	54.15	.11	13.0	1.5	57.42	.22	55.0	2.4	33.96	.06	13.7	0.2	27.72	.06	38.7	0.1
Feb. 9.4	27.62	.11	40.6	0.2	54.04	.17	14.5	1.3	57.20	.28	57.4	1.9	33.90	.11	13.9	0.2	27.66	.10	38.6	0.1
19.4	27.51	.15	40.8	0.3	53.87	.22	15.8	1.0	56.92	.32	59.3	1.5	33.79	.14	14.1	0.2	27.56	.13	38.7	0.1
Mar. 1.3	27.36	.17	41.1	0.2	53.65	.25	16.8	0.7	56.60	.34	60.8	1.0	33.65	.16	14.3	0.2	27.43	.16	38.8	0.2
11.3	27.19	.18	41.3	0.2	53.40	.27	17.5	0.4	56.26	.36	61.8	0.4	33.49	.18	14.5	0.2	27.27	.17	39.0	0.1
21.3	27.01	.19	41.5	0.1	53.13	.27	17.9	0.1	55.90	.36	62.2	0.1	33.31	.18	14.7	0.1	27.10	.18	39.1	0.2
31.2	26.82	.17	41.6	0.1	52.86	.26	18.0	0.2	55.54	.34	62.1	0.6	33.13	.17	14.8	0.1	26.92	.17	39.3	0.2
Apr. 10.2	26.65	.15	41.7	0.0	52.60	.23	17.8	0.6	55.20	.33	61.5	1.1	32.96	.15	14.9	0.1	26.75	.15	39.5	0.2
20.2	26.50	.12	41.7	0.0	52.37	.18	17.2	0.8	54.87	.30	60.4	1.5	32.81	.13	15.0	0.1	26.60	.13	39.7	0.2
30.2	26.38	.09	41.7	0.0	52.19	.14	16.4	1.1	54.57	.25	58.9	2.0	32.68	.09	15.1	0.1	26.47	.09	39.9	0.2
May 10.1	26.29	.05	41.7	0.1	52.05	.09	15.3	1.2	54.32	.21	56.9	2.4	32.59	.05	15.2	0.0	26.38	.06	40.1	0.2
20.1	26.24	.01	41.6	0.0	51.96	.02	14.1	1.4	54.11	.15	54.5	2.7	32.54	.01	15.2	0.1	26.32	.02	40.3	0.3
30.1	26.23	.04	41.6	0.0	51.94	.04	12.7	1.4	53.96	.09	51.8	3.0	32.53	.03	15.3	0.2	26.30	.03	40.6	0.3
June 9.1	26.27	.09	41.6	0.1	51.98	.10	11.3	1.4	53.87	.03	48.8	3.2	32.56	.07	15.5	0.1	26.33	.06	40.9	0.4
19.0	26.36	.12	41.7	0.0	52.08	.15	9.9	1.5	53.84	.03	45.6	3.3	32.63	.12	15.6	0.2	26.39	.11	41.3	0.4
29.0	26.48	.16	41.7	0.2	52.23	.21	8.4	1.4	53.87	.09	42.3	3.4	32.75	.16	15.8	0.3	26.50	.14	41.7	0.4
July 9.0	26.64	.20	41.9	0.1	52.44	.26	7.0	1.2	53.96	.15	38.9	3.3	32.91	.18	16.1	0.3	26.64	.17	42.1	0.5
18.9	26.84	.23	42.0	0.2	52.70	.31	5.8	1.2	54.11	.21	35.6	3.1	33.09	.22	16.4	0.2	26.81	.21	42.6	0.4
28.9	27.07	.25	42.2	0.2	53.01	.34	4.6	1.1	54.32	.25	32.5	2.9	33.31	.25	16.6	0.3	27.02	.23	43.0	0.4
Aug. 7.9	27.32	.28	42.4	0.2	53.35	.38	3.5	0.9	54.57	.30	29.6	2.5	33.56	.26	16.9	0.3	27.25	.25	43.4	0.4
17.9	27.60	.29	42.6	0.1	53.73	.40	2.6	0.7	54.87	.34	27.1	2.1	33.82	.28	17.2	0.1	27.50	.27	43.8	0.2
27.8	27.89	.30	42.7	0.1	54.13	.42	1.9	0.5	55.21	.37	25.0	1.6	34.10	.30	17.3	0.1	27.77	.29	44.0	0.2
Sept. 6.8	28.19	.32	42.8	0.0	54.55	.44	1.4	0.4	55.58	.39	23.4	1.0	34.40	.31	17.4	0.1	28.06	.30	44.2	0.0
16.8	28.51	.32	42.8	0.0	54.99	.44	1.0	0.2	55.97	.40	22.4	0.4	34.71	.32	17.5	0.1	28.36	.31	44.2	0.1
26.8	28.83	.33	42.8	0.1	55.43	.45	0.8	0.0	56.37	.41	22.0	0.3	35.03	.32	17.4	0.2	28.67	.31	44.1	0.2
Oct. 6.7	29.16	.32	42.7	0.2	55.88	.45	0.8	0.3	56.78	.41	22.3	0.9	35.35	.32	17.2	0.3	28.98	.31	43.9	0.4
16.7	29.48	.32	42.5	0.2	56.33	.44	1.1	0.4	57.19	.39	23.2	1.5	35.67	.31	16.9	0.3	29.29	.32	43.5	0.5
26.7	29.80	.31	42.3	0.3	56.77	.43	1.5	0.6	57.58	.36	24.7	2.1	35.98	.31	16.6	0.4	29.61	.30	43.0	0.5
Nov. 5.6	30.11	.29	42.0	0.3	57.20	.40	2.1	0.9	57.94	.33	26.8	2.6	36.29	.29	16.2	0.4	29.91	.29	42.5	0.6
15.6	30.40	.27	41.7	0.2	57.60	.37	3.0	1.1	58.27	.28	29.4	2.9	36.58	.27	15.8	0.4	30.20	.27	41.9	0.7
25.6	30.67	.24	41.5	0.3	57.97	.32	4.1	1.2	58.55	.22	32.3	3.3	36.85	.25	15.4	0.4	30.47	.25	41.2	0.6
Dec. 5.6	30.91	.21	41.2	0.1	58.29	.27	5.3	1.5	58.77	.16	35.6	3.4	37.10	.20	15.0	0.3	30.72	.21	40.6	0.6
15.5	31.12	.16	41.1	0.1	58.56	.21	6.8	1.5	58.93	.10	39.0	3.5	37.30	.17	14.7	0.2	30.93	.17	40.0	0.5
25.5	31.28	.11	41.0	0.1	58.77	.15	8.3	1.7	59.03	.02	42.5	3.5	37.47	.12	14.5	0.1	31.10	.12	39.5	0.4
35.5	31.39		41.1		58.92		10.0		59.05		46.0		37.59		14.4		31.22		39.1	

(CONSTANTS OF STRUVE AND PETERS.)

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	ε Geminorum.				ψ⁵ Aurigæ.				α Canis Majoris. (*Sirius.*)				θ Geminorum.				ζ Mensæ.			
	Right Ascension.		Declination *North.*		Right Ascension.		Declination *North.*		Right Ascension.		Declination *South.*		Right Ascension.		Declination *North.*		Right Ascension.		Declination *South.*	
	h m 6 38		° ′ +25 13		h m 6 40		° ′ +43 40		h m 6 41		° ′ −16 35		h m 6 46		° ′ +34 4		h m 6 47		° ′ −80 42	
	s		″		s		″		s		″		s		″		s		″	
Jan. 0.5	20.33	.10	19.1	0.2	11.43	.12	7.9	1.3	8.69	.07	26.3	2.3	47.91	.12	18.1	0.8	48.08	0.31	63.6	3.5
10.5	20.43	.05	19.3	0.3	11.55	.06	9.2	1.4	8.76	.02	28.6	2.1	48.03	.06	18.9	0.8	47.77	0.56	67.1	3.3
20.5	20.48	.00	19.6	0.4	11.61	.01	10.6	1.4	8.78	.03	30.7	1.9	48.09	.00	19.7	0.9	47.21	0.79	70.4	3.1
30.4	20.48	.06	20.0	0.4	11.60	.07	12.0	1.4	8.75	.07	32.6	1.6	48.09	.05	20.6	0.9	46.42	1.01	73.5	2.7
Feb. 9.4	20.42	.10	20.4	0.5	11.53	.13	13.4	1.2	8.68	.12	34.2	1.3	48.04	.10	21.5	0.8	45.41	1.19	76.2	2.4
19.4	20.32	.14	20.9	0.4	11.40	.18	14.6	1.0	8.56	.15	35.5	1.0	47.94	.14	22.3	0.8	44.22	1.33	78.6	1.9
Mar. 1.3	20.18	.16	21.3	0.4	11.22	.21	15.6	0.8	8.41	.17	36.5	0.7	47.80	.18	23.1	0.6	42.89	1.44	80.5	1.5
11.3	20.02	.18	21.7	0.3	11.01	.23	16.4	0.6	8.24	.19	37.2	0.3	47.62	.20	23.7	0.5	41.45	1.51	82.0	0.9
21.3	19.84	.19	22.0	0.2	10.78	.24	17.0	0.3	8.05	.19	37.5	0.0	47.42	.20	24.2	0.3	39.94	1.55	82.9	0.4
31.3	19.65	.18	22.2	0.1	10.54	.23	17.3	0.0	7.86	.19	37.5	0.3	47.22	.20	24.5	0.1	38.39	1.53	83.3	0.1
Apr. 10.2	19.47	.16	22.3	0.1	10.31	.21	17.3	0.2	7.67	.17	37.2	0.6	47.02	.18	24.6	0.0	36.86	1.49	83.2	0.6
20.2	19.31	.14	22.4	0.0	10.10	.18	17.1	0.5	7.50	.16	36.6	0.9	46.84	.16	24.6	0.2	35.37	1.42	82.6	1.2
30.2	19.17	.10	22.4	0.1	9.92	.14	16.6	0.7	7.34	.12	35.7	1.2	46.68	.12	24.4	0.4	33.95	1.30	81.4	1.6
May 10.1	19.07	.07	22.3	0.1	9.78	.09	15.9	0.9	7.22	.09	34.5	1.5	46.56	.08	24.0	0.4	32.65	1.17	79.8	2.0
20.1	19.00	.02	22.2	0.2	9.69	.04	15.0	1.1	7.13	.05	33.0	1.6	46.48	.03	23.6	0.6	31.48	1.01	77.8	2.4
30.1	18.98	.02	22.0	0.1	9.65	.01	13.9	1.1	7.08	.01	31.4	1.9	46.45	.01	23.0	0.6	30.47	0.81	75.4	2.8
June 9.1	19.00	.07	21.9	0.2	9.66	.07	12.8	1.1	7.07	.03	29.5	2.0	46.46	.06	22.4	0.7	29.66	0.61	72.6	3.0
19.0	19.07	.10	21.7	0.1	9.73	.12	11.7	1.2	7.10	.07	27.5	2.1	46.52	.10	21.7	0.6	29.05	0.39	69.6	3.2
29.0	19.17	.15	21.6	0.1	9.85	.17	10.5	1.2	7.17	.10	25.4	2.2	46.62	.15	21.1	0.7	28.66	0.16	66.4	3.3
July 9.0	19.32	.18	21.5	0.1	10.02	.22	9.3	1.1	7.27	.14	23.2	2.1	46.77	.19	20.4	0.6	28.50	0.07	63.1	3.3
19.0	19.50	.21	21.4	0.1	10.24	.25	8.2	1.1	7.41	.17	21.1	2.0	46.96	.22	19.8	0.6	28.57	0.30	59.8	3.2
28.9	19.71	.24	21.3	0.0	10.49	.29	7.1	0.9	7.58	.20	19.1	1.9	47.18	.25	19.2	0.6	28.87	0.53	56.6	3.0
Aug. 7.9	19.95	.27	21.3	0.1	10.78	.32	6.2	0.9	7.78	.22	17.2	1.6	47.43	.28	18.6	0.5	29.40	0.74	53.6	2.8
17.9	20.22	.28	21.2	0.1	11.10	.35	5.3	0.8	8.00	.25	15.6	1.4	47.71	.31	18.1	0.5	30.14	0.92	50.8	2.4
27.9	20.50	.30	21.1	0.1	11.45	.37	4.5	0.7	8.25	.26	14.2	1.0	48.02	.32	17.6	0.5	31.06	1.09	48.4	1.9
Sept. 6.8	20.80	.32	21.0	0.2	11.82	.39	3.8	0.5	8.51	.28	13.2	0.7	48.34	.34	17.1	0.4	32.15	1.21	46.5	1.4
16.8	21.12	.32	20.8	0.2	12.21	.40	3.3	0.4	8.79	.29	12.5	0.2	48.68	.35	16.7	0.4	33.36	1.30	45.1	0.7
26.8	21.44	.34	20.6	0.3	12.61	.41	2.9	0.3	9.08	.29	12.3	0.3	49.03	.36	16.3	0.4	34.66	1.34	44.4	0.2
Oct. 6.7	21.78	.33	20.3	0.3	13.02	.42	2.6	0.2	9.37	.30	12.6	0.7	49.39	.37	15.9	0.3	36.00	1.34	44.2	0.5
16.7	22.11	.33	20.0	0.4	13.44	.41	2.4	0.1	9.67	.30	13.3	1.1	49.76	.36	15.6	0.2	37.34	1.28	44.7	1.2
26.7	22.44	.33	19.6	0.3	13.85	.40	2.5	0.2	9.97	.28	14.4	1.5	50.12	.36	15.4	0.2	38.62	1.18	45.9	1.7
Nov. 5.7	22.77	.31	19.3	0.3	14.25	.38	2.7	0.4	10.25	.27	15.9	1.9	50.48	.35	15.2	0.0	39.80	1.03	47.6	2.3
15.6	23.08	.29	19.0	0.3	14.63	.36	3.1	0.6	10.52	.26	17.8	2.1	50.83	.32	15.2	0.1	40.83	0.85	49.9	2.8
25.6	23.37	.27	18.7	0.2	14.99	.32	3.7	0.8	10.78	.22	19.9	2.3	51.15	.29	15.3	0.2	41.68	0.62	52.7	3.1
Dec. 5.6	23.64	.23	18.5	0.0	15.31	.28	4.5	0.9	11.00	.19	22.2	2.4	51.44	.26	15.5	0.4	42.30	0.38	55.8	3.3
15.6	23.87	.19	18.5	0.0	15.59	.23	5.4	1.2	11.19	.15	24.6	2.4	51.70	.21	15.9	0.5	42.68	0.12	59.1	3.5
25.5	24.06	.14	18.5	0.1	15.82	.16	6.6	1.3	11.34	.10	27.0	2.3	51.91	.16	16.4	0.7	42.80	0.14	62.6	3.6
35.5	24.20		18.6		15.98		7.9		11.44		29.3		52.07		17.1		42.66		66.2	

(CONSTANTS OF STRUVE AND PETERS.)

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	ε Canis Majoris.				ζ Geminorum.				δ Canis Majoris.				63 Aurigæ.				γ² Volantis.			
	Right Ascension.		Declination *South.*		Right Ascension.		Declination *North.*		Right Ascension.		Declination *South.*		Right Ascension.		Declination *North.*		Right Ascension.		Declination *South.*	
	h m 6 55		° ′ −28 50		h m 6 58		° ′ +20 42		h m 7 4		° ′ −26 14		h m 7 5		° ′ +39 28		h m 7 9		° ′ −70 20	
	s		″		s		″		s		″		s		″		s		″	
Jan. 0.5	3.72	.07	50.4	2.9	43.03	.12	15.9	0.1	42.12	.08	51.7	2.7	24.31	.15	10.6	1.0	35.43	.02	59.9	3.7
10.5	3.79	.02	53.3	2.6	43.15	.07	15.8	0.0	42.20	.03	54.4	2.6	24.46	.09	11.6	1.1	35.41	.14	63.6	3.5
20.5	3.81	.04	55.9	2.4	43.22	.01	15.8	0.1	42.23	.02	57.0	2.4	24.55	.02	12.7	1.2	35.27	.27	67.1	3.4
30.4	3.77	.08	58.3	2.1	43.23	.03	15.9	0.2	42.21	.07	59.4	2.1	24.57	.04	13.9	1.2	35.00	.38	70.5	3.0
Feb. 9.4	3.69	.13	60.4	1.8	43.20	.08	16.1	0.3	42.14	.11	61.5	1.7	24.53	.09	15.1	1.2	34.62	.48	73.5	2.7
19.4	3.56	.17	62.2	1.4	43.12	.12	16.4	0.3	42.03	.16	63.2	1.4	24.44	.14	16.3	1.0	34.14	.56	76.2	2.2
Mar. 1.4	3.39	.20	63.6	1.0	43.00	.15	16.7	0.3	41.87	.18	64.6	1.0	24.30	.18	17.3	0.9	33.58	.63	78.4	1.7
11.3	3.19	.21	64.6	0.6	42.85	.17	17.0	0.4	41.69	.20	65.6	0.6	24.12	.21	18.2	0.7	32.95	.67	80.1	1.3
21.3	2.98	.22	65.2	0.2	42.68	.18	17.4	0.3	41.49	.21	66.2	0.3	23.91	.22	18.9	0.5	32.28	.69	81.4	0.7
31.3	2.76	.21	65.4	0.2	42.50	.17	17.7	0.2	41.28	.21	66.5	0.2	23.69	.21	19.4	0.2	31.59	.70	82.1	0.2
Apr. 10.2	2.55	.21	65.2	0.7	42.33	.16	17.9	0.2	41.07	.19	66.3	0.5	23.48	.20	19.6	0.0	30.89	.68	82.3	0.4
20.2	2.34	.18	64.5	1.0	42.17	.14	18.1	0.1	40.88	.18	65.8	0.9	23.28	.18	19.6	0.2	30.21	.65	81.9	0.8
30.2	2.16	.15	63.5	1.4	42.03	.11	18.2	0.1	40.70	.15	64.9	1.3	23.10	.14	19.4	0.4	29.56	.61	81.1	1.4
May 10.2	2.01	.12	62.1	1.7	41.92	.08	18.3	0.1	40.55	.13	63.6	1.6	22.96	.11	19.0	0.6	28.95	.54	79.7	1.8
20.1	1.89	.09	60.4	2.0	41.84	.04	18.4	0.1	40.42	.08	62.0	1.8	22.85	.06	18.4	0.8	28.41	.46	77.9	2.3
30.1	1.80	.04	58.4	2.2	41.80	.00	18.5	0.1	40.34	.05	60.2	2.1	22.79	.01	17.6	0.8	27.95	.38	75.6	2.6
June 9.1	1.76	.00	56.2	2.4	41.80	.05	18.6	0.1	40.29	.00	58.1	2.3	22.78	.04	16.8	1.0	27.57	.28	73.0	3.0
19.1	1.76	.03	53.8	2.6	41.85	.08	18.7	0.1	40.29	.03	55.8	2.5	22.82	.09	15.8	1.0	27.29	.18	70.0	3.2
29.0	1.79	.08	51.2	2.7	41.93	.12	18.8	0.1	40.32	.07	53.3	2.5	22.91	.13	14.8	1.0	27.11	.07	66.8	3.3
July 9.0	1.87	.12	48.5	2.6	42.05	.15	18.9	0.1	40.39	.11	50.8	2.5	23.04	.18	13.8	1.0	27.04	.04	63.5	3.3
19.0	1.99	.15	45.9	2.5	42.20	.19	19.0	0.1	40.50	.14	48.3	2.4	23.22	.21	12.8	1.0	27.08	.14	60.2	3.4
29.0	2.14	.19	43.4	2.4	42.39	.22	19.1	0.1	40.64	.18	45.9	2.3	23.43	.25	11.8	1.0	27.22	.25	56.8	3.2
Aug. 7.9	2.33	.22	41.0	2.2	42.61	.24	19.2	0.0	40.82	.21	43.6	2.1	23.68	.28	10.8	0.9	27.47	.35	53.6	2.9
17.9	2.55	.25	38.8	1.8	42.85	.26	19.2	0.1	41.03	.23	41.5	1.7	23.96	.32	9.9	0.8	27.82	.45	50.7	2.6
27.9	2.80	.26	37.0	1.4	43.11	.28	19.1	0.1	41.26	.26	39.8	1.4	24.28	.33	9.1	0.8	28.27	.52	48.1	2.1
Sept. 6.8	3.06	.29	35.6	0.9	43.39	.30	19.0	0.2	41.52	.28	38.4	0.9	24.61	.35	8.3	0.8	28.79	.59	46.0	1.6
16.8	3.35	.30	34.7	0.5	43.69	.31	18.8	0.4	41.80	.30	37.5	0.5	24.96	.37	7.5	0.7	29.38	.64	44.4	1.0
26.8	3.65	.31	34.2	0.1	44.00	.32	18.4	0.4	42.10	.31	37.0	0.1	25.33	.39	6.8	0.6	30.02	.67	43.4	0.4
Oct. 6.8	3.96	.32	34.3	0.7	44.32	.32	18.0	0.5	42.41	.31	37.1	0.5	25.72	.39	6.2	0.4	30.69	.68	43.0	0.3
16.7	4.28	.31	35.0	1.1	44.64	.33	17.5	0.6	42.72	.31	37.6	1.1	26.11	.39	5.8	0.4	31.37	.68	43.3	1.0
26.7	4.59	.31	36.1	1.6	44.97	.32	16.9	0.6	43.03	.31	38.7	1.6	26.50	.39	5.4	0.2	32.05	.64	44.3	1.6
Nov. 5.7	4.90	.29	37.7	2.1	45.29	.32	16.3	0.7	43.34	.29	40.3	2.0	26.89	.37	5.2	0.0	32.69	.58	45.9	2.2
15.7	5.19	.27	39.8	2.4	45.61	.29	15.6	0.6	43.63	.27	42.3	2.3	27.26	.36	5.2	0.2	33.27	.51	48.1	2.7
25.6	5.46	.24	42.2	2.7	45.90	.28	15.0	0.5	43.90	.25	44.6	2.6	27.62	.33	5.4	0.3	33.78	.42	50.8	3.1
Dec. 5.6	5.70	.20	44.9	2.8	46.18	.24	14.5	0.4	44.15	.21	47.2	2.8	27.95	.29	5.7	0.6	34.20	.31	53.9	3.4
15.6	5.90	.15	47.7	3.0	46.42	.20	14.1	0.4	44.36	.16	50.0	2.8	28.24	.25	6.3	0.7	34.51	.19	57.3	3.6
25.5	6.05	.11	50.7	2.9	46.62	.15	13.7	0.2	44.52	.12	52.8	2.8	28.49	.19	7.0	1.0	34.70	.06	60.9	3.7
35.5	6.16		53.6		46.77		13.5		44.64		55.6		28.68		8.0		34.76		64.6	

(CONSTANTS OF STRUVE AND PETERS.)

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	25 Camelop. (H.).				δ Geminorum.				Piazzi vii, 67.				β Canis Minoris.				α² Geminorum. (*Castor.*)			
	Right Ascension.		Declination *North.*		Right Ascension.		Declination *North.*		Right Ascension.		Declination *North.*		Right Ascension.		Declination *North.*		Right Ascension.		Declination *North.*	
	h m 7 11		° ′ +82 35		h m 7 14		° ′ +22 8		h m 7 21		° ′ +68 38		h m 7 22		° ′ + 8 28		h m 7 28		° ′ +32 5	
	s		″		s		″		s		″		s		″		s		″	
Jan. 0.5	65.83	0.53	19.8	3.1	41.65	.14	61.9	0.1	26.90	.28	67.8	2.5	13.27	.14	24.4	1.0	48.03	.17	19.7	0.5
10.5	66.36	0.19	22.9	3.1	41.79	.09	61.8	0.0	27.18	.15	70.3	2.7	13.41	.08	23.4	0.8	48.20	.10	20.2	0.6
20.5	66.55	0.16	26.0	3.1	41.88	.03	61.8	0.2	27.33	.02	73.0	2.6	13.49	.03	22.6	0.6	48.30	.05	20.8	0.8
30.5	66.39	0.50	29.1	3.0	41.91	.02	62.0	0.3	27.35	.10	75.6	2.6	13.52	.01	22.0	0.5	48.35	.00	21.6	0.8
Feb. 9.4	65.89	0.80	32.1	2.6	41.89	.07	62.3	0.4	27.25	.22	78.2	2.3	13.51	.06	21.5	0.3	48.35	.06	22.4	0.9
19.4	65.09	1.06	34.7	2.3	41.82	.11	62.7	0.4	27.03	.32	80.5	2.1	13.45	.10	21.2	0.2	48.29	.11	23.3	0.9
Mar. 1.4	64.03	1.28	37.0	1.8	41.71	.14	63.1	0.4	26.71	.41	82.6	1.7	13.35	.14	21.0	0.0	48.18	.15	24.2	0.8
11.3	62.75	1.43	38.8	1.3	41.57	.16	63.5	0.4	26.30	.46	84.3	1.3	13.21	.15	21.0	0.1	48.03	.18	25.0	0.7
21.3	61.32	1.52	40.1	0.7	41.41	.18	63.9	0.4	25.84	.49	85.6	0.8	13.06	.16	21.1	0.2	47.85	.19	25.7	0.5
31.3	59.80	1.53	40.8	0.1	41.23	.18	64.3	0.3	25.35	.51	86.4	0.3	12.90	.17	21.3	0.2	47.66	.19	26.2	0.4
Apr. 10.3	58.27	1.48	40.9	0.4	41.05	.16	64.6	0.2	24.84	.49	86.7	0.1	12.73	.16	21.5	0.4	47.47	.18	26.6	0.3
20.2	56.79	1.38	40.5	1.0	40.89	.14	64.8	0.2	24.35	.45	86.6	0.7	12.57	.14	21.9	0.4	47.29	.17	26.9	0.0
30.2	55.41	1.22	39.5	1.5	40.75	.13	65.0	0.1	23.90	.40	85.9	1.1	12.43	.12	22.3	0.5	47.12	.14	26.9	0.1
May 10.2	54.19	1.02	38.0	2.0	40.62	.09	65.1	0.1	23.50	.32	84.8	1.5	12.31	.09	22.8	0.5	46.98	.10	26.8	0.2
20.2	53.17	0.77	36.0	2.2	40.53	.05	65.2	0.0	23.18	.23	83.3	1.8	12.22	.05	23.3	0.6	46.88	.07	26.6	0.3
30.1	52.40	0.51	33.8	2.6	40.48	.01	65.2	0.0	22.95	.14	81.5	2.1	12.17	.02	23.9	0.7	46.81	.03	26.3	0.5
June 9.1	51.89	0.23	31.2	2.8	40.47	.03	65.2	0.0	22.81	.04	79.4	2.3	12.15	.02	24.6	0.7	46.78	.02	25.8	0.5
19.1	51.66	0.06	28.4	3.0	40.50	.07	65.2	0.0	22.77	.06	77.1	2.4	12.17	.05	25.3	0.7	46.80	.05	25.3	0.6
29.0	51.72	0.34	25.4	3.0	40.57	.11	65.2	0.0	22.83	.16	74.7	2.5	12.22	.09	26.0	0.8	46.85	.10	24.7	0.7
July 9.0	52.06	0.62	22.4	2.9	40.68	.14	65.2	0.1	22.99	.25	72.2	2.5	12.31	.12	26.8	0.7	46.95	.14	24.0	0.7
19.0	52.68	0.88	19.5	2.9	40.82	.17	65.1	0.1	23.24	.35	69.7	2.5	12.43	.15	27.5	0.7	47.09	.17	23.3	0.7
29.0	53.56	1.12	16.6	2.8	40.99	.21	65.0	0.1	23.59	.43	67.2	2.3	12.58	.18	28.2	0.6	47.26	.21	22.6	0.7
Aug. 7.9	54.68	1.35	13.8	2.4	41.20	.23	64.9	0.1	24.02	.50	64.9	2.3	12.76	.20	28.8	0.5	47.47	.24	21.9	0.7
17.9	56.03	1.55	11.4	2.2	41.43	.25	64.8	0.2	24.52	.57	62.6	2.0	12.96	.23	29.3	0.4	47.71	.26	21.2	0.8
27.9	57.58	1.72	9.2	2.0	41.68	.27	64.6	0.3	25.09	.63	60.6	1.8	13.19	.25	29.7	0.2	47.97	.29	20.4	0.8
Sept. 6.9	59.30	1.86	7.2	1.5	41.95	.29	64.3	0.4	25.72	.68	58.8	1.5	13.44	.27	29.9	0.0	48.26	.31	19.6	0.8
16.8	61.16	1.96	5.7	1.2	42.24	.31	63.9	0.5	26.40	.73	57.3	1.3	13.71	.28	29.9	0.3	48.57	.33	18.8	0.7
26.8	63.12	2.04	4.5	0.7	42.55	.32	63.4	0.5	27.13	.75	56.0	0.9	13.99	.30	29.6	0.4	48.90	.34	18.1	0.8
Oct. 6.8	65.16	2.08	3.8	0.3	42.87	.33	62.9	0.6	27.88	.77	55.1	0.5	14.29	.30	29.2	0.7	49.24	.36	17.3	0.7
16.7	67.24	2.07	3.5	0.2	43.20	.34	62.3	0.7	28.65	.78	54.6	0.2	14.59	.31	28.5	0.8	49.60	.36	16.6	0.7
26.7	69.31	2.02	3.7	0.6	43.54	.33	61.6	0.7	29.43	.77	54.4	0.3	14.90	.31	27.7	1.0	49.96	.37	15.9	0.6
Nov. 5.7	71.33	1.93	4.3	1.2	43.87	.32	60.9	0.7	30.20	.74	54.7	0.6	15.21	.31	26.7	1.2	50.33	.36	15.3	0.5
15.7	73.26	1.78	5.5	1.6	44.19	.31	60.2	0.6	30.94	.71	55.3	1.1	15.52	.29	25.5	1.2	50.69	.34	14.8	0.4
25.6	75.04	1.59	7.1	2.0	44.50	.29	59.6	0.6	31.65	.64	56.4	1.5	15.81	.27	24.3	1.3	51.03	.32	14.4	0.2
Dec. 5.6	76.63	1.35	9.1	2.4	44.79	.26	59.0	0.5	32.29	.56	57.9	1.9	16.08	.24	23.0	1.3	51.35	.29	14.2	0.0
15.6	77.98	1.07	11.5	2.8	45.05	.22	58.5	0.3	32.85	.47	59.8	2.1	16.32	.21	21.7	1.2	51.64	.25	14.2	0.2
25.6	79.05	0.75	14.3	3.0	45.27	.17	58.2	0.2	33.32	.36	61.9	2.4	16.53	.17	20.5	1.0	51.89	.21	14.4	0.3
35.5	79.80		17.3		45.44		58.0		33.68		64.3		16.70		19.5		52.10		14.7	

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Canis Minoris. (*Procyon.*)				β Geminorum. (*Pollux.*)				φ Geminorum.				26 Lyncis.				Groombridge 1374.			
	Right Ascension.		Declination *North.*		Right Ascension.		Declination *North.*		Right Ascension.		Declination *North.*		Right Ascension.		Declination *North.*		Right Ascension.		Declination *North.*	
	h m 7 34		° ′ + 5 27		h m 7 39		° ′ +28 14		h m 7 47		° ′ +26 59		h m 7 48		° ′ +47 47		h m 7 49		° ′ +74 9	
	s		″		s		″		s		″		s		″		s		″	
Jan. 0.6	32.57	.14	31.3	1.2	45.22	.17	47.1	0.2	56.06	.18	66.5	0.1	5.96	.23	62.3	1.3	21.68	0.43	40.7	2.6
10.5	32.71	.09	30.1	1.1	45.39	.12	47.3	0.4	56.24	.13	66.6	0.3	6.19	.15	63.6	1.5	22.11	0.27	43.3	2.8
20.5	32.80	.04	29.0	0.9	45.51	.06	47.7	0.5	56.37	.07	66.9	0.4	6.34	.08	65.1	1.7	22.38	0.10	46.1	2.8
30.5	32.84	.01	28.1	0.7	45.57	.00	48.2	0.6	56.44	.01	67.3	0.6	6.42	.01	66.8	1.7	22.48	0.07	48.9	2.8
Feb. 9.4	32.83	.05	27.4	0.5	45.57	.05	48.8	0.8	56.45	.04	67.9	0.6	6.43	.06	68.5	1.7	22.41	0.23	51.7	2.7
19.4	32.78	.09	26.9	0.3	45.52	.09	49.6	0.7	56.41	.09	68.5	0.7	6.37	.12	70.2	1.6	22.18	0.37	54.4	2.5
Mar. 1.4	32.69	.13	26.6	0.2	45.43	.14	50.3	0.7	56.32	.12	69.2	0.7	6.25	.18	71.8	1.4	21.81	0.49	56.9	2.0
11.4	32.56	.15	26.4	0.0	45.29	.16	51.0	0.6	56.20	.16	69.9	0.7	6.07	.21	73.2	1.2	21.32	0.59	58.9	1.7
21.3	32.41	.16	26.4	0.1	45.13	.18	51.6	0.6	56.04	.17	70.6	0.6	5.86	.24	74.4	1.0	20.73	0.65	60.6	1.2
31.3	32.25	.17	26.5	0.2	44.95	.18	52.2	0.5	55.87	.18	71.2	0.5	5.62	.25	75.4	0.6	20.08	0.68	61.8	0.6
Apr. 10.3	32.08	.16	26.7	0.3	44.77	.18	52.7	0.3	55.69	.17	71.7	0.3	5.37	.24	76.0	0.3	19.40	0.68	62.4	0.1
20.3	31.92	.15	27.0	0.5	44.59	.16	53.0	0.2	55.52	.16	72.0	0.3	5.13	.22	76.3	0.1	18.72	0.64	62.5	0.4
30.2	31.77	.12	27.5	0.5	44.43	.14	53.2	0.0	55.36	.14	72.3	0.1	4.91	.20	76.2	0.3	18.08	0.59	62.1	0.9
May 10.2	31.65	.09	28.0	0.6	44.29	.11	53.2	0.0	55.22	.11	72.4	0.0	4.71	.16	75.9	0.6	17.49	0.51	61.2	1.3
20.2	31.56	.07	28.6	0.7	44.18	.07	53.2	0.2	55.11	.08	72.4	0.1	4.55	.12	75.3	0.9	16.98	0.41	59.9	1.8
30.1	31.49	.03	29.3	0.7	44.11	.04	53.0	0.3	55.03	.04	72.3	0.2	4.43	.07	74.4	1.1	16.57	0.30	58.1	2.1
June 9.1	31.46	.01	30.0	0.8	44.07	.01	52.7	0.3	54.99	.00	72.1	0.3	4.36	.02	73.3	1.3	16.27	0.17	56.0	2.4
19.1	31.47	.04	30.8	0.9	44.08	.04	52.4	0.4	54.99	.04	71.8	0.3	4.34	.04	72.0	1.4	16.10	0.04	53.6	2.6
29.0	31.51	.07	31.7	0.8	44.12	.09	52.0	0.4	55.03	.08	71.5	0.4	4.38	.08	70.6	1.6	16.06	0.09	51.0	2.7
July 9.0	31.58	.10	32.5	0.8	44.21	.12	51.6	0.5	55.11	.11	71.1	0.4	4.46	.14	69.0	1.6	16.15	0.21	48.3	2.9
19.0	31.68	.14	33.3	0.8	44.33	.15	51.1	0.5	55.22	.15	70.7	0.5	4.60	.18	67.4	1.6	16.36	0.34	45.4	2.8
29.0	31.82	.16	34.1	0.7	44.48	.19	50.6	0.6	55.37	.18	70.2	0.5	4.78	.22	65.8	1.7	16.70	0.45	42.6	2.7
Aug. 8.0	31.98	.19	34.8	0.6	44.67	.22	50.0	0.6	55.55	.21	69.7	0.6	5.00	.27	64.1	1.6	17.15	0.57	39.9	2.7
17.9	32.17	.22	35.4	0.5	44.89	.24	49.4	0.7	55.76	.23	69.1	0.6	5.27	.30	62.5	1.6	17.72	0.66	37.2	2.5
27.9	32.39	.23	35.9	0.2	45.13	.27	48.7	0.7	55.99	.26	68.5	0.7	5.57	.34	60.9	1.5	18.38	0.75	34.7	2.2
Sept. 6.9	32.62	.26	36.1	0.0	45.40	.29	48.0	0.7	56.25	.28	67.8	0.8	5.91	.37	59.4	1.4	19.13	0.84	32.5	2.0
16.8	32.88	.27	36.1	0.2	45.69	.31	47.3	0.8	56.53	.31	67.0	0.8	6.28	.39	58.0	1.3	19.97	0.90	30.5	1.7
26.8	33.15	.29	35.9	0.5	46.00	.33	46.5	0.8	56.84	.32	66.2	0.9	6.67	.42	56.7	1.2	20.87	0.95	28.8	1.4
Oct. 6.8	33.44	.30	35.4	0.7	46.33	.34	45.7	0.9	57.16	.33	65.3	0.9	7.09	.43	55.5	1.0	21.82	1.00	27.4	0.9
16.8	33.74	.31	34.7	0.9	46.67	.35	44.8	0.8	57.49	.35	64.4	0.9	7.52	.45	54.5	0.7	22.82	1.01	26.5	0.5
26.7	34.05	.31	33.8	1.1	47.02	.35	44.0	0.8	57.84	.35	63.5	0.9	7.97	.45	53.8	0.6	23.83	1.01	26.0	0.1
Nov. 5.7	34.36	.31	32.7	1.3	47.37	.35	43.2	0.7	58.19	.35	62.6	0.8	8.42	.45	53.2	0.2	24.84	1.00	25.9	0.4
15.7	34.67	.29	31.4	1.4	47.72	.34	42.5	0.6	58.54	.34	61.8	0.7	8.87	.43	53.0	0.0	25.84	0.95	26.3	0.8
25.7	34.96	.27	30.0	1.5	48.06	.32	41.9	0.5	58.88	.32	61.1	0.6	9.30	.41	53.0	0.3	26.79	0.88	27.1	1.3
Dec. 5.6	35.23	.25	28.5	1.5	48.38	.29	41.4	0.3	59.20	.30	60.5	0.4	9.71	.37	53.3	0.6	27.67	0.79	28.4	1.8
15.6	35.48	.21	27.0	1.4	48.67	.25	41.1	0.1	59.50	.26	60.1	0.3	10.08	.33	53.9	0.9	28.46	0.67	30.2	2.1
25.6	35.69	.18	25.6	1.3	48.92	.21	41.0	0.1	59.76	.21	59.8	0.0	10.41	.27	54.8	1.2	29.13	0.53	32.3	2.4
35.5	35.87		24.3		49.13		41.1		59.97		59.8		10.68		56.0		29.66		34.7	

(CONSTANTS OF STRUVE AND PETERS.)

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	ω^1 Cancri.				15 Argûs (ρ).				3 Ursæ Maj. (H.).				ζ^1 Cancri.				β Cancri.			
	Right Ascension.		Declination *North.*		Right Ascension.		Declination *South.*		Right Ascension.		Declination *North.*		Right Ascension.		Declination *North.*		Right Ascension.		Declination *North.*	
	h m 7 55		° ′ +25 38		h m 8 3		° ′ −24 2		h m 8 3		° ′ +68 44		h m 8 6		° ′ +17 55		h m 8 11		° ′ + 9 27	
	s		″		s		″		s		″		s		″		s		″	
Jan. 0.6	25.82	.19	32.3	0.0	40.63	.15	23.7	2.8	47.65	.39	30.7	2.3	59.87	.19	22.3	0.5	35.06	.18	60.7	1.1
10.5	26.01	.13	32.3	0.1	40.78	.10	26.5	2.7	48.04	.26	33.0	2.6	60.06	.13	21.8	0.4	35.24	.13	59.6	0.9
20.5	26.14	.08	32.4	0.4	40.88	.04	29.2	2.5	48.30	.13	35.6	2.6	60.19	.08	21.4	0.2	35.37	.08	58.7	0.7
30.5	26.22	.02	32.8	0.5	40.92	.01	31.7	2.3	48.43	.01	38.2	2.7	60.27	.03	21.2	0.0	35.45	.03	58.0	0.5
Feb. 9.5	26.24	.03	33.3	0.6	40.91	.06	34.0	2.0	48.44	.12	40.9	2.6	60.30	.02	21.2	0.2	35.48	.02	57.5	0.3
19.4	26.21	.08	33.9	0.6	40.85	.10	36.0	1.7	48.32	.24	43.5	2.4	60.28	.06	21.4	0.3	35.46	.06	57.2	0.1
Mar. 1.4	26.13	.12	34.5	0.7	40.75	.13	37.7	1.4	48.08	.33	45.9	2.1	60.22	.10	21.7	0.3	35.40	.10	57.1	0.0
11.4	26.01	.15	35.2	0.6	40.62	.17	39.1	1.0	47.75	.41	48.0	1.7	60.12	.14	22.0	0.5	35.30	.13	57.1	0.1
21.3	25.86	.16	35.8	0.6	40.45	.18	40.1	0.7	47.34	.46	49.7	1.3	59.98	.15	22.5	0.4	35.17	.14	57.2	0.2
31.3	25.70	.18	36.4	0.5	40.27	.19	40.8	0.3	46.88	.49	51.0	0.8	59.83	.16	22.9	0.5	35.03	.16	57.4	0.3
Apr. 10.3	25.52	.17	36.9	0.4	40.08	.19	41.1	0.1	46.39	.49	51.8	0.4	59.67	.16	23.4	0.4	34.87	.15	57.7	0.4
20.3	25.35	.16	37.3	0.3	39.89	.18	41.0	0.4	45.90	.48	52.2	0.2	59.51	.15	23.8	0.4	34.72	.15	58.1	0.4
30.2	25.19	.14	37.6	0.2	39.71	.17	40.6	0.8	45.42	.44	52.0	0.6	59.36	.14	24.2	0.3	34.57	.13	58.5	0.5
May 10.2	25.05	.11	37.8	0.1	39.54	.14	39.8	1.1	44.98	.38	51.4	1.0	59.22	.11	24.5	0.3	34.44	.11	59.0	0.5
20.2	24.94	.08	37.9	0.1	39.40	.11	38.7	1.4	44.60	.31	50.4	1.5	59.11	.08	24.8	0.3	34.33	.08	59.5	0.6
30.2	24.86	.04	37.8	0.1	39.29	.09	37.3	1.7	44.29	.23	48.9	1.9	59.03	.05	25.1	0.2	34.25	.05	60.1	0.5
June 9.1	24.82	.01	37.7	0.2	39.20	.05	35.6	1.9	44.06	.14	47.0	2.1	58.98	.01	25.3	0.2	34.20	.02	60.6	0.6
19.1	24.81	.03	37.5	0.2	39.15	.01	33.7	2.0	43.92	.04	44.9	2.3	58.97	.02	25.5	0.2	34.18	.01	61.2	0.6
29.1	24.84	.07	37.3	0.3	39.14	.02	31.7	2.2	43.88	.05	42.6	2.6	58.99	.05	25.7	0.1	34.19	.04	61.8	0.6
July 9.0	24.91	.10	37.0	0.4	39.16	.05	29.5	2.2	43.93	.15	40.0	2.6	59.04	.09	25.8	0.0	34.23	.08	62.4	0.5
19.0	25.01	.14	36.6	0.4	39.21	.09	27.3	2.3	44.08	.23	37.4	2.7	59.13	.12	25.8	0.0	34.31	.10	62.9	0.4
29.0	25.15	.17	36.2	0.5	39.30	.12	25.0	2.1	44.31	.33	34.7	2.6	59.25	.15	25.8	0.1	34.41	.14	63.3	0.4
Aug. 8.0	25.32	.20	35.7	0.6	39.42	.15	22.9	2.0	44.64	.40	32.1	2.6	59.40	.17	25.7	0.2	34.55	.16	63.7	0.3
17.9	25.52	.22	35.1	0.6	39.57	.18	20.9	1.8	45.04	.48	29.5	2.5	59.57	.20	25.5	0.3	34.71	.19	64.0	0.1
27.9	25.74	.25	34.5	0.7	39.75	.21	19.1	1.4	45.52	.56	27.0	2.3	59.77	.23	25.2	0.4	34.90	.22	64.1	0.0
Sept. 6.9	25.99	.28	33.8	0.8	39.96	.24	17.7	1.1	46.08	.61	24.7	2.1	60.00	.25	24.8	0.5	35.12	.23	64.1	0.2
16.9	26.27	.30	33.0	0.8	40.20	.27	16.6	0.7	46.69	.67	22.6	1.9	60.25	.28	24.3	0.7	35.35	.26	63.9	0.4
26.8	26.57	.31	32.2	0.9	40.47	.29	15.9	0.1	47.36	.71	20.7	1.5	60.53	.29	23.6	0.8	35.61	.28	63.5	0.7
Oct. 6.8	26.88	.33	31.3	1.0	40.76	.30	15.8	0.3	48.07	.75	19.2	1.2	60.82	.31	22.8	1.0	35.89	.30	62.8	0.9
16.8	27.21	.34	30.3	0.9	41.06	.31	16.1	0.8	48.82	.78	18.0	0.8	61.13	.33	21.8	1.1	36.19	.31	61.9	1.1
26.7	27.55	.35	29.4	1.0	41.37	.32	16.9	1.3	49.60	.78	17.2	0.4	61.46	.33	20.7	1.1	36.50	.32	60.8	1.2
Nov. 5.7	27.90	.35	28.4	0.9	41.69	.32	18.2	1.7	50.38	.78	16.8	0.0	61.79	.33	19.6	1.2	36.82	.32	59.6	1.3
15.7	28.25	.34	27.5	0.8	42.01	.31	19.9	2.1	51.16	.75	16.8	0.5	62.12	.33	18.4	1.1	37.14	.32	58.3	1.4
25.7	28.59	.33	26.7	0.7	42.32	.29	22.0	2.5	51.91	.71	17.3	0.9	62.45	.32	17.3	1.1	37.46	.30	56.9	1.5
Dec. 5.6	28.92	.30	26.0	0.6	42.61	.27	24.5	2.6	52.62	.64	18.2	1.4	62.77	.29	16.2	1.0	37.76	.28	55.4	1.4
15.6	29.22	.26	25.4	0.3	42.88	.22	27.1	2.8	53.26	.56	19.6	1.8	63.06	.25	15.2	0.9	38.04	.25	54.0	1.3
25.6	29.48	.22	25.1	0.2	43.10	.18	29.9	2.9	53.82	.46	21.4	2.1	63.31	.22	14.3	0.7	38.29	.22	52.7	1.2
35.6	29.70		24.9		43.28		32.8		54.28		23.5		63.53		13.6		38.51		51.5	

(CONSTANTS OF STRUVE AND PETERS.)

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	30 Monocerotis.				θ Chamæleontis.				η Cancri.				σ Hydræ.				γ Cancri.			
	Right Ascension.		Declination *South*.		Right Ascension.		Declination *South*.		Right Ascension.		Declination *North*.		Right Ascension.		Declination *North*.		Right Ascension.		Declination *North*.	
	h m 8 21		° ′ − 3 36		h m 8 23		° ′ −77 11		h m 8 27		° ′ +20 44		h m 8 33		° ′ + 3 39		h m 8 38		° ′ +21 47	
	s		″		s		″		s		″		s		″		s		″	
Jan. 0.6	7.10	.18	29.3	1.9	29.06	0.24	15.8	3.7	27.05	.21	62.5	0.5	60.29	.19	43.6	1.5	1.45	.22	46.0	0.5
10.6	7.28	.13	31.2	1.7	29.30	0.05	19.5	3.7	27.26	.16	62.0	0.3	60.48	.15	42.1	1.3	1.67	.18	45.5	0.2
20.5	7.41	.08	32.9	1.5	29.35	0.14	23.2	3.8	27.42	.11	61.7	0.0	60.63	.10	40.8	1.2	1.85	.12	45.3	0.0
30.5	7.49	.03	34.4	1.3	29.21	0.32	27.0	3.6	27.53	.05	61.7	0.2	60.73	.05	39.6	0.9	1.97	.06	45.3	0.2
Feb. 9.5	7.52	.02	35.7	1.1	28.89	0.49	30.6	3.4	27.58	.00	61.9	0.3	60.78	.00	38.7	0.7	2.03	.01	45.5	0.4
19.4	7.50	.06	36.8	0.8	28.40	0.64	34.0	3.1	27.58	.04	62.2	0.4	60.78	.04	38.0	0.4	2.04	.04	45.9	0.5
Mar. 1.4	7.44	.09	37.6	0.6	27.76	0.76	37.1	2.8	27.54	.09	62.6	0.5	60.74	.08	37.6	0.3	2.00	.08	46.4	0.6
11.4	7.35	.13	38.2	0.4	27.00	0.87	39.9	2.4	27.45	.12	63.1	0.6	60.66	.12	37.3	0.1	1.92	.11	47.0	0.6
21.4	7.22	.14	38.6	0.1	26.13	0.95	42.3	1.9	27.33	.15	63.7	0.6	60.54	.13	37.2	0.0	1.81	.14	47.6	0.7
31.3	7.08	.16	38.7	0.0	25.18	1.01	44.2	1.4	27.18	.16	64.3	0.6	60.41	.15	37.2	0.2	1.67	.16	48.3	0.6
Apr. 10.3	6.92	.15	38.7	0.2	24.17	1.04	45.6	0.8	27.02	.16	64.9	0.5	60.26	.15	37.4	0.4	1.51	.16	48.9	0.6
20.3	6.77	.15	38.5	0.5	23.13	1.04	46.4	0.4	26.86	.15	65.4	0.4	60.11	.15	37.8	0.4	1.35	.15	49.5	0.5
30.3	6.62	.14	38.0	0.6	22.09	1.01	46.8	0.2	26.71	.14	65.8	0.4	59.96	.13	38.2	0.5	1.20	.14	50.0	0.4
May 10.2	6.48	.12	37.4	0.7	21.08	0.98	46.6	0.7	26.57	.12	66.2	0.3	59.83	.12	38.7	0.6	1.06	.13	50.4	0.3
20.2	6.36	.09	36.7	0.9	20.10	0.90	45.9	1.2	26.45	.09	66.5	0.2	59.71	.09	39.3	0.7	0.93	.10	50.7	0.2
30.2	6.27	.06	35.8	1.0	19.20	0.82	44.7	1.7	26.36	.07	66.7	0.2	59.62	.06	40.0	0.7	0.83	.07	50.9	0.1
June 9.2	6.21	.04	34.8	1.1	18.38	0.71	43.0	2.1	26.29	.03	66.9	0.0	59.56	.04	40.7	0.8	0.76	.03	51.0	0.0
19.1	6.17	.00	33.7	1.1	17.67	0.59	40.9	2.5	26.26	.00	66.9	0.0	59.52	.01	41.5	0.8	0.73	.01	51.0	0.0
29.1	6.17	.03	32.6	1.3	17.08	0.45	38.4	2.8	26.26	.04	66.9	0.1	59.51	.02	42.3	0.8	0.72	.02	51.0	0.2
July 9.1	6.20	.05	31.3	1.2	16.63	0.30	35.6	3.0	26.30	.07	66.8	0.1	59.53	.05	43.1	0.8	0.74	.06	50.8	0.2
19.0	6.25	.09	30.1	1.2	16.33	0.14	32.6	3.2	26.37	.10	66.7	0.2	59.58	.08	43.9	0.8	0.80	.09	50.6	0.3
29.0	6.34	.12	28.9	1.1	16.19	0.03	29.4	3.3	26.47	.13	66.5	0.4	59.66	.11	44.7	0.6	0.89	.12	50.3	0.4
Aug. 8.0	6.46	.14	27.8	1.0	16.22	0.20	26.1	3.1	26.60	.16	66.1	0.4	59.77	.14	45.3	0.6	1.01	.15	49.9	0.6
18.0	6.60	.17	26.8	0.8	16.42	0.36	23.0	3.0	26.76	.18	65.7	0.5	59.91	.16	45.9	0.3	1.16	.18	49.3	0.6
27.9	6.77	.20	26.0	0.5	16.78	0.52	20.0	2.8	26.94	.22	65.2	0.7	60.07	.19	46.2	0.2	1.34	.21	48.7	0.7
Sept. 6.9	6.97	.22	25.5	0.3	17.30	0.66	17.2	2.3	27.16	.24	64.5	0.8	60.26	.22	46.4	0.0	1.55	.23	48.0	0.9
16.9	7.19	.25	25.2	0.0	17.96	0.79	14.9	1.9	27.40	.27	63.7	0.9	60.48	.24	46.4	0.3	1.78	.26	47.1	1.0
26.8	7.44	.27	25.2	0.3	18.75	0.89	13.0	1.3	27.67	.28	62.8	1.0	60.72	.27	46.1	0.6	2.04	.28	46.1	1.1
Oct. 6.8	7.71	.29	25.5	0.7	19.64	0.96	11.7	0.7	27.95	.31	61.8	1.1	60.99	.29	45.5	0.8	2.32	.31	45.0	1.2
16.8	8.00	.30	26.2	1.0	20.60	1.00	11.0	0.1	28.26	.33	60.7	1.2	61.28	.30	44.7	1.1	2.63	.32	43.8	1.4
26.8	8.30	.31	27.2	1.3	21.60	1.01	10.9	0.6	28.59	.34	59.5	1.3	61.58	.31	43.6	1.3	2.95	.34	42.4	1.3
Nov. 5.7	8.61	.31	28.5	1.5	22.61	0.98	11.5	1.3	28.93	.34	58.2	1.2	61.89	.32	42.3	1.5	3.29	.35	41.1	1.3
15.7	8.92	.31	30.0	1.7	23.59	0.92	12.8	1.9	29.27	.34	57.0	1.2	62.21	.32	40.8	1.6	3.64	.34	39.8	1.2
25.7	9.23	.30	31.7	1.9	24.51	0.81	14.7	2.4	29.61	.33	55.8	1.2	62.53	.31	39.2	1.7	3.98	.34	38.6	1.2
Dec. 5.7	9.53	.27	33.6	2.0	25.32	0.68	17.1	2.9	29.94	.31	54.6	1.0	62.84	.29	37.5	1.8	4.32	.32	37.4	1.0
15.6	9.80	.25	35.6	2.0	26.00	0.52	20.0	3.3	30.25	.28	53.6	0.8	63.13	.26	35.7	1.7	4.64	.29	36.4	0.9
25.6	10.05	.21	37.6	1.9	26.52	0.35	23.3	3.5	30.53	.24	52.8	0.6	63.39	.22	34.0	1.6	4.93	.25	35.5	0.6
35.6	10.26		39.5		26.87		26.8		30.77		52.2		63.61		32.4		5.18		34.9	

(CONSTANTS OF STRUVE AND PETERS.)

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	ε Hydræ.				σ² Cancri (mean).				ι Ursæ Majoris.				σ² Ursæ Majoris.				κ Cancri.			
	Right Ascension.		Declination North.		Right Ascension.		Declination North.		Right Ascension.		Declination North.		Right Ascension.		Declination North.		Right Ascension.		Declination North.	
	h m 8 41		° ′ + 6 45		h m 8 48		° ′ +30 55		h m 8 52		° ′ +48 23		h m 9 2		° ′ +67 29		h m 9 2		° ′ +11 1	
	s		″		s		″		s		″		s		″		s		″	
Jan. 0.6	57.61	.21	13.5	1.4	41.87	.25	26.3	0.0	59.31	.31	53.6	0.9	25.19	.49	70.1	1.8	49.24	.23	66.7	1.2
10.6	57.82	.16	12.1	1.1	42.12	.20	26.3	0.3	59.62	.24	54.5	1.3	25.68	.39	71.9	2.2	49.47	.18	65.5	0.9
20.5	57.98	.11	11.0	1.0	42.32	.14	26.6	0.5	59.86	.17	55.8	1.6	26.07	.28	74.1	2.4	49.65	.14	64.6	0.8
30.5	58.09	.06	10.0	0.7	42.46	.08	27.1	0.7	60.03	.10	57.4	1.7	26.35	.15	76.5	2.6	49.79	.08	63.8	0.5
Feb. 9.5	58.15	.01	9.3	0.6	42.54	.02	27.8	0.9	60.13	.03	59.1	1.8	26.50	.03	79.1	2.7	49.87	.03	63.3	0.3
19.5	58.16	.04	8.7	0.3	42.56	.03	28.7	1.0	60.16	.05	60.9	1.9	26.53	.09	81.8	2.6	49.90	.01	63.0	0.1
Mar. 1.4	58.12	.07	8.4	0.1	42.53	.08	29.7	1.1	60.11	.10	62.8	1.8	26.44	.19	84.4	2.5	49.89	.06	62.9	0.1
11.4	58.05	.11	8.3	0.0	42.45	.11	30.8	1.0	60.01	.16	64.6	1.7	26.25	.28	86.9	2.2	49.83	.09	63.0	0.2
21.4	57.94	.13	8.3	0.2	42.34	.15	31.8	1.0	59.85	.19	66.3	1.4	25.97	.36	89.1	1.9	49.74	.12	63.2	0.3
31.3	57.81	.14	8.5	0.2	42.19	.16	32.8	0.9	59.66	.22	67.7	1.2	25.61	.41	91.0	1.5	49.62	.13	63.5	0.4
Apr. 10.3	57.67	.15	8.7	0.4	42.03	.17	33.7	0.7	59.44	.24	68.9	0.9	25.20	.44	92.5	1.1	49.49	.15	63.9	0.5
20.3	57.52	.15	9.1	0.4	41.86	.17	34.4	0.6	59.20	.24	69.8	0.6	24.76	.45	93.6	0.6	49.34	.14	64.4	0.5
30.3	57.37	.13	9.5	0.5	41.69	.16	35.0	0.3	58.96	.22	70.4	0.2	24.31	.44	94.2	0.0	49.20	.13	64.9	0.5
May 10.2	57.24	.12	10.0	0.6	41.53	.14	35.3	0.2	58.74	.20	70.6	0.1	23.87	.41	94.2	0.4	49.07	.12	65.4	0.5
20.2	57.12	.10	10.6	0.6	41.39	.12	35.5	0.0	58.54	.17	70.5	0.4	23.46	.36	93.8	0.9	48.95	.11	65.9	0.5
30.2	57.02	.07	11.2	0.6	41.27	.08	35.5	0.2	58.37	.13	70.1	0.8	23.10	.31	92.9	1.3	48.84	.08	66.4	0.5
June 9.2	56.95	.04	11.8	0.7	41.19	.05	35.3	0.3	58.24	.09	69.3	1.1	22.79	.24	91.6	1.7	48.76	.05	66.9	0.5
19.1	56.91	.01	12.5	0.6	41.14	.02	35.0	0.5	58.15	.05	68.2	1.3	22.55	.17	89.9	2.0	48.71	.02	67.4	0.4
29.1	56.90	.02	13.1	0.7	41.12	.01	34.5	0.6	58.10	.01	66.9	1.5	22.38	.08	87.9	2.3	48.69	.00	67.8	0.4
July 9.1	56.92	.05	13.8	0.6	41.13	.05	33.9	0.8	58.09	.05	65.4	1.7	22.30	.01	85.6	2.6	48.69	.03	68.2	0.3
19.0	56.97	.07	14.4	0.5	41.18	.09	33.1	0.8	58.14	.09	63.7	1.8	22.29	.08	83.0	2.7	48.72	.06	68.5	0.3
29.0	57.04	.10	14.9	0.5	41.27	.12	32.3	1.0	58.23	.13	61.9	2.0	22.37	.16	80.3	2.9	48.78	.09	68.8	0.2
Aug. 8.0	57.14	.13	15.4	0.3	41.39	.15	31.3	1.1	58.36	.17	59.9	2.1	22.53	.24	77.4	2.9	48.87	.11	69.0	0.0
18.0	57.27	.16	15.7	0.2	41.54	.18	30.2	1.2	58.53	.22	57.8	2.0	22.77	.32	74.5	2.9	48.98	.15	69.0	0.1
27.9	57.43	.19	15.9	0.0	41.72	.21	29.0	1.3	58.75	.26	55.8	2.1	23.09	.40	71.6	2.8	49.13	.17	68.9	0.3
Sept. 6.9	57.62	.21	15.9	0.2	41.93	.25	27.7	1.3	59.01	.30	53.7	2.1	23.49	.46	68.8	2.7	49.30	.20	68.6	0.5
16.9	57.83	.24	15.7	0.4	42.18	.27	26.4	1.4	59.31	.34	51.6	2.0	23.95	.54	66.1	2.6	49.50	.22	68.1	0.7
26.9	58.07	.26	15.3	0.7	42.45	.30	25.0	1.5	59.65	.37	49.6	1.9	24.49	.59	63.5	2.3	49.72	.26	67.4	0.9
Oct. 6.8	58.33	.29	14.6	0.9	42.75	.32	23.5	1.4	60.02	.40	47.7	1.8	25.08	.64	61.2	2.0	49.98	.27	66.5	1.1
16.8	58.62	.30	13.7	1.2	43.07	.35	22.1	1.5	60.42	.43	45.9	1.6	25.72	.69	59.2	1.7	50.25	.30	65.4	1.3
26.8	58.92	.32	12.5	1.3	43.42	.36	20.6	1.4	60.85	.45	44.3	1.4	26.41	.73	57.5	1.4	50.55	.32	64.1	1.4
Nov. 5.7	59.24	.32	11.2	1.5	43.78	.37	19.2	1.3	61.30	.46	42.9	1.1	27.14	.74	56.1	0.9	50.87	.33	62.7	1.5
15.7	59.56	.32	9.7	1.6	44.15	.37	17.9	1.1	61.76	.46	41.8	0.8	27.88	.74	55.2	0.4	51.20	.33	61.2	1.7
25.7	59.88	.31	8.1	1.7	44.52	.37	16.8	0.9	62.22	.45	41.0	0.4	28.62	.73	54.8	0.1	51.53	.33	59.5	1.6
Dec. 5.7	60.19	.30	6.4	1.6	44.89	.35	15.9	0.7	62.67	.43	40.6	0.0	29.35	.69	54.9	0.5	51.86	.31	57.9	1.6
15.6	60.49	.27	4.8	1.6	45.24	.31	15.2	0.5	63.10	.39	40.6	0.4	30.04	.63	55.4	1.1	52.17	.29	56.3	1.5
25.6	60.76	.23	3.2	1.5	45.55	.28	14.7	0.2	63.49	.35	41.0	0.7	30.67	.56	56.5	1.5	52.46	.26	54.8	1.3
35.6	60.99		1.7		45.83		14.5		63.84		41.7		31.23		58.0		52.72		53.5	

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	θ Hydræ.				β Argûs.				ι Argûs.				α Lyncis.				α Hydræ.			
	Right Ascension.		Declination *North.*		Right Ascension.		Declination *South.*		Right Ascension.		Declination *South.*		Right Ascension.		Declination *North.*		Right Ascension.		Declination *South.*	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	9 9		+ 2 41		9 12		−69 20		9 14		−58 53		9 15		+34 46		9 23		− 8 15	
	s		″		s		″		s		″		s		″		s		″	
Jan. 0.6	37.91	.23	58.3	1.7	15.03	.33	15.7	3.6	40.63	.27	19.7	3.5	30.96	.29	36.9	0.0	7.01	.23	43.5	2.2
10.6	38.14	.18	56.6	1.5	15.36	.21	19.3	3.8	40.90	.19	23.2	3.7	31.25	.23	36.9	0.4	7.24	.19	45.7	2.1
20.6	38.32	.13	55.1	1.3	15.57	.10	23.1	3.8	41.09	.11	26.9	3.8	31.48	.17	37.3	0.7	7.43	.14	47.8	2.0
30.5	38.45	.09	53.8	1.0	15.67	.02	26.9	3.8	41.20	.03	30.7	3.7	31.65	.12	38.0	0.9	7.57	.09	49.8	1.7
Feb. 9.5	38.54	.03	52.8	0.9	15.65	.13	30.7	3.7	41.23	.06	34.4	3.6	31.77	.05	38.9	1.1	7.66	.04	51.5	1.5
19.5	38.57	.01	51.9	0.6	15.52	.24	34.4	3.5	41.17	.13	38.0	3.3	31.82	.00	40.0	1.2	7.70	.00	53.0	1.3
Mar. 1.5	38.56	.05	51.3	0.4	15.28	.34	37.9	3.2	41.04	.20	41.3	3.1	31.82	.06	41.2	1.3	7.70	.05	54.3	1.0
11.4	38.51	.09	50.9	0.1	14.94	.41	41.1	2.8	40.84	.26	44.4	2.6	31.76	.10	42.5	1.3	7.65	.08	55.3	0.7
21.4	38.42	.11	50.8	0.0	14.53	.48	43.9	2.5	40.58	.30	47.0	2.3	31.66	.13	43.8	1.3	7.57	.11	56.0	0.5
31.4	38.31	.13	50.8	0.1	14.05	.53	46.4	2.0	40.28	.33	49.3	1.8	31.53	.16	45.1	1.1	7.46	.13	56.5	0.3
Apr. 10.3	38.18	.14	50.9	0.3	13.52	.57	48.4	1.5	39.95	.36	51.1	1.3	31.37	.17	46.2	0.9	7.33	.14	56.8	0.0
20.3	38.04	.14	51.2	0.4	12.95	.58	49.9	1.0	39.59	.37	52.4	0.8	31.20	.17	47.1	0.8	7.19	.14	56.8	0.2
30.3	37.90	.13	51.6	0.5	12.37	.59	50.9	0.4	39.22	.38	53.2	0.3	31.03	.17	47.9	0.5	7.05	.14	56.6	0.4
May 10.3	37.77	.12	52.1	0.5	11.78	.58	51.3	0.1	38.84	.36	53.5	0.2	30.86	.16	48.4	0.3	6.91	.13	56.2	0.6
20.2	37.65	.11	52.6	0.7	11.20	.56	51.2	0.6	38.48	.34	53.3	0.8	30.70	.13	48.7	0.0	6.78	.11	55.6	0.7
30.2	37.54	.08	53.3	0.7	10.64	.51	50.6	1.2	38.14	.31	52.5	1.2	30.57	.11	48.7	0.1	6.67	.09	54.9	0.9
June 9.2	37.46	.06	54.0	0.7	10.13	.47	49.4	1.6	37.83	.28	51.3	1.6	30.46	.08	48.6	0.4	6.58	.08	54.0	1.0
19.2	37.40	.03	54.7	0.8	9.66	.41	47.8	2.1	37.55	.24	49.7	2.1	30.38	.04	48.2	0.6	6.50	.05	53.0	1.2
29.1	37.37	.01	55.5	0.8	9.25	.33	45.7	2.4	37.31	.19	47.6	2.4	30.34	.01	47.6	0.8	6.45	.02	51.8	1.2
July 9.1	37.36	.02	56.3	0.7	8.92	.25	43.3	2.7	37.12	.14	45.2	2.7	30.33	.02	46.8	1.0	6.43	.00	50.6	1.3
19.1	37.38	.05	57.0	0.7	8.67	.16	40.6	3.0	36.98	.07	42.5	3.0	30.35	.05	45.8	1.1	6.43	.03	49.3	1.2
29.0	37.43	.08	57.7	0.6	8.51	.07	37.6	3.1	36.91	.02	39.5	3.0	30.40	.09	44.7	1.3	6.46	.05	48.1	1.2
Aug. 8.0	37.51	.10	58.3	0.5	8.44	.03	34.5	3.2	36.89	.05	36.5	3.0	30.49	.12	43.4	1.4	6.51	.08	46.9	1.1
18.0	37.61	.13	58.8	0.4	8.47	.14	31.3	3.1	36.94	.12	33.5	3.0	30.61	.16	42.0	1.5	6.59	.11	45.8	0.9
28.0	37.74	.16	59.2	0.1	8.61	.24	28.2	2.9	37.06	.19	30.5	2.8	30.77	.19	40.5	1.6	6.70	.15	44.9	0.7
Sept. 6.9	37.90	.19	59.3	0.1	8.85	.34	25.3	2.7	37.25	.25	27.7	2.4	30.96	.22	38.9	1.7	6.85	.17	44.2	0.5
16.9	38.09	.21	59.2	0.4	9.19	.43	22.6	2.2	37.50	.31	25.3	2.1	31.18	.26	37.2	1.7	7.02	.20	43.7	0.2
26.9	38.30	.25	58.8	0.6	9.62	.52	20.4	1.7	37.81	.38	23.2	1.5	31.44	.29	35.5	1.8	7.22	.23	43.5	0.2
Oct. 6.9	38.55	.27	58.2	0.9	10.14	.58	18.7	1.2	38.19	.42	21.7	1.0	31.73	.32	33.7	1.8	7.45	.26	43.7	0.5
16.8	38.82	.29	57.3	1.1	10.72	.64	17.5	0.6	38.61	.46	20.7	0.3	32.05	.35	31.9	1.7	7.71	.29	44.2	0.9
26.8	39.11	.31	56.2	1.4	11.36	.67	16.9	0.1	39.07	.48	20.4	0.3	32.40	.37	30.2	1.6	8.00	.30	45.1	1.2
Nov. 5.8	39.42	.32	54.8	1.6	12.03	.68	17.0	0.8	39.55	.50	20.7	0.9	32.77	.38	28.6	1.5	8.30	.32	46.3	1.6
15.7	39.74	.32	53.2	1.7	12.71	.67	17.8	1.4	40.05	.49	21.6	1.6	33.15	.39	27.1	1.3	8.62	.33	47.9	1.8
25.7	40.06	.32	51.5	1.9	13.38	.63	19.2	2.1	40.54	.48	23.2	2.1	33.54	.38	25.8	1.1	8.95	.32	49.7	2.0
Dec. 5.7	40.38	.31	49.6	1.9	14.01	.57	21.3	2.6	41.02	.43	25.3	2.7	33.92	.38	24.7	0.8	9.27	.31	51.7	2.2
15.7	40.69	.29	47.7	1.8	14.58	.49	23.9	3.0	41.45	.38	28.0	3.1	34.30	.35	23.9	0.5	9.58	.29	53.9	2.3
25.6	40.98	.25	45.9	1.8	15.07	.40	26.9	3.4	41.83	.32	31.1	3.4	34.65	.31	23.4	0.2	9.87	.25	56.2	2.3
35.6	41.23		44.1		15.47		30.3		42.15		34.5		34.96		23.2		10.12		58.5	

(CONSTANTS OF STRUVE AND PETERS.)

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	1 Draconis (H.).				*d* Ursæ Majoris.				θ Ursæ Majoris.				10 Leonis Minoris.				*o* Leonis.			
	Right Ascension.		Declination *North.*		Right Ascension.		Declination *North.*		Right Ascension.		Declination *North.*		Right Ascension.		Declination *North.*		Right Ascension.		Declination *North.*	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	9 24		+81 43		9 26		+70 13		9 26		+52 5		9 28		+36 47		9 36		+10 18	
	s		″		s		″		s		″		s		″		s		″	
Jan. 0.6	15.45	1.26	38.5	2.1	28.52	.60	43.4	1.7	46.95	.37	27.1	0.9	39.21	.30	63.5	0.1	17.65	.25	26.0	1.3
10.6	16.71	1.01	40.6	2.5	29.12	.48	45.1	2.1	47.32	.30	28.0	1.2	39.51	.25	63.6	0.4	17.90	.22	24.7	1.2
20.6	17.72	0.73	43.1	2.8	29.60	.37	47.2	2.4	47.62	.23	29.2	1.6	39.76	.20	64.0	0.7	18.12	.16	23.5	0.9
30.5	18.45	0.42	45.9	3.0	29.97	.23	49.6	2.6	47.85	.16	30.8	1.8	39.96	.13	64.7	1.0	18.28	.12	22.6	0.6
Feb. 9.5	18.87	0.12	48.9	3.1	30.20	.09	52.2	2.8	48.01	.07	32.6	2.0	40.09	.07	65.7	1.2	18.40	.06	22.0	0.4
19.5	18.99	0.19	52.0	3.1	30.29	.04	55.0	2.8	48.08	.00	34.6	2.1	40.16	.01	66.9	1.4	18.46	.02	21.6	0.2
Mar. 1.5	18.80	0.48	55.1	2.9	30.25	.16	57.8	2.6	48.08	.07	36.7	2.1	40.17	.04	68.3	1.4	18.48	.03	21.4	0.0
11.4	18.32	0.73	58.0	2.6	30.09	.28	60.4	2.5	48.01	.13	38.8	2.0	40.13	.09	69.7	1.4	18.45	.06	21.4	0.2
21.4	17.59	0.95	60.6	2.2	29.81	.37	62.9	2.2	47.88	.18	40.8	1.8	40.04	.13	71.1	1.4	18.39	.09	21.6	0.3
31.4	16.64	1.12	62.8	1.8	29.44	.44	65.1	1.8	47.70	.22	42.6	1.5	39.91	.15	72.5	1.2	18.30	.12	21.9	0.4
Apr. 10.4	15.52	1.23	64.6	1.2	29.00	.48	66.9	1.3	47.48	.24	44.1	1.2	39.76	.17	73.7	1.1	18.18	.13	22.3	0.5
20.3	14.29	1.29	65.8	0.7	28.52	.51	68.2	0.8	47.24	.26	45.3	0.9	39.59	.18	74.8	0.8	18.05	.13	22.8	0.6
30.3	13.00	1.30	66.5	0.2	28.01	.50	69.0	0.4	46.98	.25	46.2	0.5	39.41	.17	75.6	0.6	17.92	.13	23.4	0.5
May 10.3	11.70	1.27	66.7	0.5	27.51	.49	69.4	0.2	46.73	.23	46.7	0.1	39.24	.16	76.2	0.4	17.79	.13	23.9	0.6
20.2	10.43	1.18	66.2	0.9	27.02	.45	69.2	0.7	46.50	.21	46.8	0.2	39.08	.14	76.6	0.1	17.66	.11	24.5	0.6
30.2	9.25	1.06	65.3	1.5	26.57	.40	68.5	1.2	46.29	.18	46.6	0.7	38.94	.12	76.7	0.2	17.55	.09	25.1	0.5
June 9.2	8.19	0.91	63.8	2.0	26.17	.33	67.3	1.5	46.11	.14	45.9	1.0	38.82	.09	76.5	0.4	17.46	.07	25.6	0.5
19.2	7.28	0.72	61.8	2.3	25.84	.25	65.8	2.0	45.97	.10	44.9	1.3	38.73	.06	76.1	0.6	17.39	.05	26.1	0.4
29.1	6.56	0.52	59.5	2.7	25.59	.18	63.8	2.3	45.87	.06	43.6	1.6	38.67	.03	75.5	0.9	17.34	.02	26.5	0.4
July 9.1	6.04	0.30	56.8	3.0	25.41	.08	61.5	2.6	45.81	.01	42.0	1.8	38.64	.00	74.6	1.0	17.32	.00	26.9	0.3
19.1	5.74	0.08	53.8	3.2	25.33	.01	58.9	2.8	45.80	.03	40.2	2.1	38.64	.04	73.6	1.3	17.32	.03	27.2	0.3
29.1	5.66	0.14	50.6	3.3	25.34	.10	56.1	3.0	45.83	.08	38.1	2.2	38.68	.08	72.3	1.4	17.35	.05	27.5	0.1
Aug. 8.0	5.80	0.37	47.3	3.4	25.44	.19	53.1	3.1	45.91	.13	35.9	2.3	38.76	.11	70.9	1.5	17.40	.08	27.6	0.0
18.0	6.17	0.59	43.9	3.4	25.63	.28	50.0	3.1	46.04	.18	33.6	2.4	38.87	.15	69.4	1.7	17.48	.11	27.6	0.2
28.0	6.76	0.81	40.5	3.3	25.91	.37	46.9	3.0	46.22	.22	31.2	2.5	39.02	.18	67.7	1.7	17.59	.14	27.4	0.4
Sept. 6.9	7.57	1.01	37.2	3.2	26.28	.46	43.9	3.0	46.44	.27	28.7	2.5	39.20	.21	66.0	1.9	17.73	.17	27.0	0.5
16.9	8.58	1.19	34.0	3.0	26.74	.53	40.9	2.9	46.71	.32	26.2	2.4	39.41	.25	64.1	1.9	17.90	.20	26.5	0.7
26.9	9.77	1.37	31.0	2.7	27.27	.61	38.0	2.6	47.03	.35	23.8	2.4	39.66	.28	62.2	2.0	18.10	.23	25.8	1.0
Oct. 6.9	11.14	1.52	28.3	2.3	27.88	.68	35.4	2.4	47.38	.40	21.4	2.2	39.94	.32	60.2	1.9	18.33	.26	24.8	1.2
16.8	12.66	1.64	26.0	2.0	28.56	.74	33.0	2.0	47.78	.43	19.2	2.0	40.26	.35	58.3	1.8	18.59	.28	23.6	1.4
26.8	14.30	1.74	24.0	1.5	29.30	.78	31.0	1.7	48.21	.46	17.2	1.8	40.61	.37	56.5	1.8	18.87	.31	22.2	1.6
Nov. 5.8	16.04	1.80	22.5	1.0	30.08	.81	29.3	1.2	48.67	.48	15.4	1.5	40.98	.39	54.7	1.6	19.18	.32	20.6	1.7
15.8	17.84	1.82	21.5	0.4	30.89	.83	28.1	0.7	49.15	.49	13.9	1.1	41.37	.39	53.1	1.4	19.50	.34	18.9	1.7
25.7	19.66	1.78	21.1	0.1	31.72	.82	27.4	0.2	49.64	.49	12.8	0.7	41.76	.40	51.7	1.2	19.84	.33	17.2	1.8
Dec. 5.7	21.44	1.71	21.2	0.7	32.54	.79	27.2	0.3	50.13	.48	12.1	0.3	42.16	.39	50.5	0.8	20.17	.33	15.4	1.8
15.7	23.15	1.58	21.9	1.3	33.33	.74	27.5	0.8	50.61	.45	11.8	0.1	42.55	.37	49.7	0.6	20.50	.31	13.6	1.6
25.6	24.73	1.40	23.2	1.8	34.07	.65	28.3	1.4	51.06	.40	11.9	0.5	42.92	.33	49.1	0.2	20.81	.28	12.0	1.5
35.6	26.13		25.0		34.72		29.7		51.46		12.4		43.25		48.9		21.09		10.5	

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	ζ Chamæleontis.				ε Leonis.				μ Leonis.				19 Leonis Minoris.				π Leonis.			
	Right Ascension.		Declination South.		Right Ascension.		Declination North.		Right Ascension.		Declination North.		Right Ascension.		Declination North.		Right Ascension.		Declination North.	
	h m 9 36		° ' −80 31		h m 9 40		° ' +24 11		h m 9 47		° ' +26 25		h m 9 52		° ' +41 29		h m 9 55		° ' + 8 28	
	s		"		s		"		s		"		s		"		s		"	
Jan. 0.6	41.81	0.71	37.6	3.3	41.22	.28	35.3	0.7	35.31	.29	67.1	0.6	6.90	.34	16.6	0.1	24.18	.27	54.4	1.6
10.6	42.52	0.48	40.9	3.6	41.50	.23	34.6	0.4	35.60	.25	66.5	0.3	7.24	.29	16.7	0.5	24.45	.23	52.8	1.3
20.6	43.00	0.25	44.5	3.8	41.73	.19	34.2	0.1	35.85	.19	66.2	0.0	7.53	.23	17.2	0.8	24.68	.18	51.5	1.1
30.6	43.25	0.01	48.3	3.8	41.92	.13	34.1	0.2	36.04	.14	66.2	0.3	7.76	.17	18.0	1.2	24.86	.14	50.4	0.8
Feb. 9.5	43.26	0.22	52.1	3.8	42.05	.08	34.3	0.5	36.18	.09	66.5	0.6	7.93	.11	19.2	1.4	25.00	.08	49.6	0.5
19.5	43.04	0.45	55.9	3.7	42.13	.03	34.8	0.6	36.27	.03	67.1	0.8	8.04	.04	20.6	1.6	25.08	.03	49.1	0.4
Mar. 1.5	42.59	0.65	59.6	3.5	42.16	.02	35.4	0.8	36.30	.01	67.9	0.9	8.08	.02	22.2	1.8	25.11	.00	48.7	0.1
11.4	41.94	0.83	63.1	3.2	42.14	.07	36.2	0.9	36.29	.06	68.8	1.0	8.06	.07	24.0	1.7	25.11	.05	48.6	0.1
21.4	41.11	0.99	66.3	2.9	42.07	.10	37.1	0.9	36.23	.10	69.8	1.1	7.99	.12	25.7	1.6	25.06	.08	48.7	0.3
31.4	40.12	1.11	69.2	2.5	41.97	.12	38.0	1.0	36.13	.12	70.9	1.0	7.87	.15	27.3	1.5	24.98	.10	49.0	0.3
Apr. 10.4	39.01	1.22	71.7	2.0	41.85	.14	39.0	0.8	36.01	.14	71.9	1.0	7.72	.17	28.8	1.3	24.88	.12	49.3	0.5
20.3	37.79	1.28	73.7	1.5	41.71	.15	39.8	0.8	35.87	.14	72.9	0.8	7.55	.18	30.1	1.1	24.76	.12	49.8	0.5
30.3	36.51	1.33	75.2	1.0	41.56	.14	40.6	0.7	35.73	.15	73.7	0.7	7.37	.19	31.2	0.8	24.64	.13	50.3	0.6
May 10.3	35.18	1.33	76.2	0.5	41.42	.14	41.3	0.5	35.58	.14	74.4	0.6	7.18	.18	32.0	0.5	24.51	.12	50.9	0.6
20.3	33.85	1.32	76.7	0.1	41.28	.12	41.8	0.4	35.44	.12	75.0	0.4	7.00	.16	32.5	0.2	24.39	.11	51.5	0.6
30.2	32.53	1.26	76.6	0.6	41.16	.10	42.2	0.2	35.32	.11	75.4	0.2	6.84	.15	32.7	0.1	24.28	.10	52.1	0.5
June 9.2	31.27	1.19	76.0	1.1	41.06	.08	42.4	0.1	35.21	.09	75.6	0.0	6.69	.12	32.6	0.5	24.18	.08	52.6	0.6
19.2	30.08	1.07	74.9	1.6	40.98	.05	42.5	0.1	35.12	.06	75.6	0.2	6.57	.09	32.1	0.7	24.10	.06	53.2	0.5
29.1	29.01	0.94	73.3	2.0	40.93	.03	42.4	0.2	35.06	.03	75.4	0.3	6.48	.06	31.4	1.0	24.04	.03	53.7	0.4
July 9.1	28.07	0.77	71.3	2.5	40.90	.00	42.2	0.4	35.03	.01	75.1	0.5	6.42	.02	30.4	1.2	24.01	.02	54.1	0.4
19.1	27.30	0.59	68.8	2.7	40.90	.03	41.8	0.6	35.02	.02	74.6	0.7	6.40	.01	29.2	1.5	23.99	.01	54.5	0.3
29.1	26.71	0.38	66.1	3.0	40.93	.05	41.2	0.7	35.04	.05	73.9	0.8	6.41	.05	27.7	1.7	24.00	.04	54.8	0.2
Aug. 8.0	26.33	0.16	63.1	3.2	40.98	.09	40.5	0.8	35.09	.08	73.1	1.0	6.46	.08	26.0	1.8	24.04	.06	55.0	0.1
18.0	26.17	0.07	59.9	3.1	41.07	.11	39.7	1.0	35.17	.11	72.1	1.1	6.54	.12	24.2	2.0	24.10	.09	55.1	0.1
28.0	26.24	0.30	56.8	3.1	41.18	.15	38.7	1.2	35.28	.14	71.0	1.3	6.66	.16	22.2	2.1	24.19	.12	55.0	0.3
Sept. 7.0	26.54	0.53	53.7	2.8	41.33	.18	37.5	1.3	35.42	.17	69.7	1.5	6.82	.20	20.1	2.2	24.31	.15	54.7	0.5
16.9	27.07	0.75	50.9	2.6	41.51	.21	36.2	1.4	35.59	.21	68.2	1.6	7.02	.23	17.9	2.2	24.46	.18	54.2	0.7
26.9	27.82	0.94	48.3	2.1	41.72	.25	34.8	1.6	35.80	.24	66.6	1.7	7.25	.28	15.7	2.3	24.64	.21	53.5	1.0
Oct. 6.9	28.76	1.11	46.2	1.6	41.97	.27	33.2	1.6	36.04	.27	64.9	1.7	7.53	.31	13.4	2.3	24.85	.25	52.5	1.1
16.8	29.87	1.24	44.6	1.1	42.24	.30	31.6	1.8	36.31	.30	63.2	1.8	7.84	.35	11.1	2.1	25.10	.27	51.4	1.4
26.8	31.11	1.32	43.5	0.4	42.54	.33	29.8	1.7	36.61	.33	61.4	1.9	8.19	.38	9.0	2.0	25.37	.30	50.0	1.6
Nov. 5.8	32.43	1.36	43.1	0.3	42.87	.35	28.1	1.8	36.94	.35	59.5	1.8	8.57	.40	7.0	1.9	25.67	.32	48.4	1.7
15.8	33.79	1.35	43.4	0.9	43.22	.35	26.3	1.7	37.29	.36	57.7	1.7	8.97	.42	5.1	1.6	25.99	.33	46.7	1.9
25.7	35.14	1.28	44.3	1.5	43.57	.36	24.6	1.5	37.65	.37	56.0	1.6	9.39	.42	3.5	1.3	26.32	.33	44.8	1.9
Dec. 5.7	36.42	1.18	45.8	2.2	43.93	.35	23.1	1.4	38.02	.36	54.4	1.4	9.81	.42	2.2	0.9	26.65	.33	42.9	1.9
15.7	37.60	1.02	48.0	2.7	44.28	.34	21.7	1.1	38.38	.34	53.0	1.1	10.23	.40	1.3	0.6	26.98	.32	41.0	1.8
25.7	38.62	0.84	50.7	3.1	44.62	.30	20.6	0.9	38.72	.32	51.9	0.8	10.63	.36	0.7	0.2	27.30	.29	39.2	1.6
35.6	39.46		53.8		44.92		19.7		39.04		51.1		10.99		0.5		27.59		37.6	

(CONSTANTS OF STRUVE AND PETERS.)

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Leonis. (*Regulus.*)				32 Ursæ Majoris.				λ Ursæ Majoris.				γ¹ Leonis.				μ Hydræ.			
	Right Ascension.		Declination *North*.		Right Ascension.		Declination *North*.		Right Ascension.		Declination *North*.		Right Ascension.		Declination *North*.		Right Ascension.		Declination *South*.	
	h m 10 3		° ′ +12 24		h m 10 11		° ′ +65 33		h m 10 11		° ′ +43 21		h m 10 14		° ′ +20 17		h m 10 21		° ′ −16 22	
	s		″		s		″		s		″		s		″		s		″	
Jan. 0.7	31.44	.28	45.3	1.4	26.82	.57	36.3	1.0	36.77	.36	62.9	0.0	57.21	.29	66.8	1.1	41.16	.27	7.6	2.5
10.6	31.72	.24	43.9	1.1	27.39	.49	37.3	1.5	37.13	.32	62.9	0.4	57.50	.26	65.7	0.8	41.43	.24	10.1	2.5
20.6	31.96	.19	42.8	0.9	27.88	.41	38.8	1.9	37.45	.25	63.3	0.9	57.76	.22	64.9	0.4	41.67	.19	12.6	2.4
30.6	32.15	.14	41.9	0.6	28.29	.30	40.7	2.3	37.70	.20	64.2	1.2	57.98	.16	64.5	0.2	41.86	.15	15.0	2.3
Feb. 9.5	32.29	.10	41.3	0.3	28.59	.18	43.0	2.5	37.90	.13	65.4	1.5	58.14	.11	64.3	0.1	42.01	.10	17.3	2.1
19.5	32.39	.04	41.0	0.1	28.77	.08	45.5	2.6	38.03	.07	66.9	1.7	58.25	.06	64.4	0.4	42.11	.05	19.4	1.9
Mar. 1.5	32.43	.00	40.9	0.1	28.85	.02	48.1	2.7	38.10	.00	68.6	1.8	58.31	.02	64.8	0.6	42.16	.00	21.3	1.6
11.5	32.43	.04	41.0	0.3	28.83	.13	50.8	2.6	38.10	.05	70.4	1.9	58.33	.03	65.4	0.7	42.16	.03	22.9	1.4
21.4	32.39	.07	41.3	0.4	28.70	.22	53.4	2.5	38.05	.10	72.3	1.8	58.30	.07	66.1	0.9	42.13	.07	24.3	1.0
31.4	32.32	.10	41.7	0.6	28.48	.28	55.9	2.1	37.95	.14	74.1	1.7	58.23	.09	67.0	0.8	42.06	.09	25.3	0.8
Apr. 10.4	32.22	.12	42.3	0.6	28.20	.33	58.0	1.8	37.81	.16	75.8	1.5	58.14	.11	67.8	0.9	41.97	.11	26.1	0.5
20.4	32.10	.12	42.9	0.6	27.87	.37	59.8	1.4	37.65	.18	77.3	1.2	58.03	.13	68.7	0.9	41.86	.12	26.6	0.3
30.3	31.98	.13	43.5	0.7	27.50	.39	61.2	0.9	37.47	.19	78.5	1.0	57.90	.13	69.6	0.8	41.74	.13	26.9	0.0
May 10.3	31.85	.12	44.2	0.6	27.11	.39	62.1	0.4	37.28	.19	79.5	0.6	57.77	.12	70.4	0.7	41.61	.13	26.9	0.3
20.3	31.73	.11	44.8	0.6	26.72	.38	62.5	0.0	37.09	.17	80.1	0.3	57.65	.12	71.1	0.5	41.48	.12	26.6	0.5
30.2	31.62	.10	45.4	0.5	26.34	.35	62.5	0.6	36.92	.16	80.4	0.0	57.53	.11	71.6	0.4	41.36	.12	26.1	0.7
June 9.2	31.52	.09	45.9	0.4	25.99	.31	61.9	1.0	36.76	.14	80.4	0.4	57.42	.09	72.0	0.3	41.24	.10	25.4	0.9
19.2	31.43	.06	46.3	0.4	25.68	.27	60.9	1.5	36.62	.11	80.0	0.7	57.33	.07	72.3	0.1	41.14	.09	24.5	1.1
29.2	31.37	.04	46.7	0.3	25.41	.20	59.4	1.8	36.51	.08	79.3	1.0	57.26	.05	72.4	0.0	41.05	.08	23.4	1.2
July 9.1	31.33	.02	47.0	0.2	25.21	.15	57.6	2.2	36.43	.05	78.3	1.2	57.21	.03	72.4	0.2	40.97	.05	22.2	1.4
19.1	31.31	.00	47.2	0.1	25.06	.08	55.4	2.5	36.38	.02	77.1	1.5	57.18	.01	72.2	0.3	40.92	.03	20.8	1.4
29.1	31.31	.03	47.3	0.1	24.98	.01	52.9	2.8	36.36	.02	75.6	1.8	57.17	.02	71.9	0.5	40.89	.00	19.4	1.4
Aug. 8.1	31.34	.06	47.2	0.2	24.97	.05	50.1	2.9	36.38	.06	73.8	2.0	57.19	.05	71.4	0.7	40.89	.02	18.0	1.3
18.0	31.40	.08	47.0	0.3	25.02	.13	47.2	3.1	36.44	.09	71.8	2.1	57.24	.08	70.7	0.8	40.91	.05	16.7	1.3
28.0	31.48	.12	46.7	0.6	25.15	.20	44.1	3.2	36.53	.14	69.7	2.3	57.32	.11	69.9	1.1	40.96	.08	15.4	1.1
Sept. 7.0	31.60	.14	46.1	0.7	25.35	.27	40.9	3.2	36.67	.17	67.4	2.3	57.43	.14	68.8	1.2	41.04	.12	14.3	0.9
16.9	31.74	.18	45.4	0.9	25.62	.35	37.7	3.1	36.84	.22	65.1	2.5	57.57	.17	67.6	1.4	41.16	.15	13.4	0.6
26.9	31.92	.21	44.5	1.2	25.97	.41	34.6	3.0	37.06	.26	62.6	2.4	57.74	.21	66.2	1.5	41.31	.19	12.8	0.2
Oct. 6.9	32.13	.24	43.3	1.3	26.38	.49	31.6	2.9	37.32	.30	60.2	2.5	57.95	.24	64.7	1.7	41.50	.22	12.6	0.1
16.9	32.37	.27	42.0	1.6	26.87	.54	28.7	2.6	37.62	.34	57.7	2.4	58.19	.27	63.0	1.9	41.72	.26	12.7	0.5
26.8	32.64	.30	40.4	1.7	27.41	.60	26.1	2.3	37.96	.37	55.3	2.2	58.46	.31	61.1	1.9	41.98	.29	13.2	0.9
Nov. 5.8	32.94	.32	38.7	1.8	28.01	.64	23.8	2.0	38.33	.40	53.1	2.0	58.77	.33	59.2	1.9	42.27	.31	14.1	1.3
15.8	33.26	.33	36.9	1.8	28.65	.68	21.8	1.5	38.73	.43	51.1	1.8	59.10	.34	57.3	2.0	42.58	.33	15.4	1.7
25.8	33.59	.34	35.1	1.9	29.33	.69	20.3	1.0	39.16	.43	49.3	1.5	59.44	.35	55.3	1.8	42.91	.34	17.1	2.0
Dec. 5.7	33.93	.34	33.2	1.8	30.02	.68	19.3	0.5	39.59	.43	47.8	1.1	59.79	.36	53.5	1.7	43.25	.33	19.1	2.2
15.7	34.27	.32	31.4	1.7	30.70	.66	18.8	0.1	40.02	.42	46.7	0.7	60.15	.34	51.8	1.6	43.58	.32	21.3	2.4
25.7	34.59	.30	29.7	1.6	31.36	.61	18.9	0.7	40.44	.39	46.0	0.3	60.49	.32	50.2	1.2	43.90	.30	23.7	2.5
35.6	34.89		28.1		31.97		19.6		40.83		45.7		60.81		49.0		44.20		26.2	

(CONSTANTS OF STRUVE AND PETERS.)

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	β Leonis Minoris.				α Antliæ.				9 Draconis (H.).				ρ Leonis.				41 Leonis Minoris.			
	Right Ascension.		Declination *North.*		Right Ascension.		Declination *South.*		Right Ascension.		Declination *North.*		Right Ascension.		Declination *North.*		Right Ascension.		Declination *North.*	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	10 22		+37 10		10 22		−30 36		10 27		+76 10		10 28		+ 9 46		10 38		+23 39	
	s		″		s		″		s		″		s		″		s		″	
Jan. 0.7	37.35	.34	20.3	0.4	59.13	.29	2.5	2.9	24.67	0.95	44.9	1.1	0.96	.29	32.5	1.6	27.90	.32	52.1	1.1
10.6	37.69	.30	19.9	0.1	59.42	.24	5.4	3.0	25.62	0.83	46.0	1.7	1.25	.26	30.9	1.3	28.22	.28	51.0	0.7
20.6	37.99	.25	20.0	0.4	59.66	.20	8.4	3.0	26.45	0.69	47.7	2.2	1.51	.21	29.6	1.1	28.50	.24	50.3	0.4
30.6	38.24	.20	20.4	0.8	59.86	.15	11.4	2.9	27.14	0.52	49.9	2.6	1.72	.16	28.5	0.8	28.74	.19	49.9	0.0
Feb. 9.6	38.44	.14	21.2	1.1	60.01	.09	14.3	2.8	27.66	0.34	52.5	2.8	1.88	.12	27.7	0.6	28.93	.14	49.9	0.2
19.5	38.58	.08	22.3	1.4	60.10	.04	17.1	2.6	28.00	0.15	55.3	2.9	2.00	.07	27.1	0.3	29.07	.08	50.1	0.6
Mar. 1.5	38.66	.02	23.7	1.5	60.14	.00	19.7	2.4	28.15	0.02	58.2	3.0	2.07	.02	26.8	0.1	29.15	.04	50.7	0.8
11.5	38.68	.03	25.2	1.6	60.14	.04	22.1	2.1	28.13	0.20	61.2	2.9	2.09	.01	26.7	0.2	29.19	.01	51.5	0.9
21.4	38.65	.08	26.8	1.6	60.10	.09	24.2	1.8	27.93	0.36	64.1	2.7	2.08	.05	26.9	0.3	29.18	.04	52.4	1.1
31.4	38.57	.11	28.4	1.6	60.01	.11	26.0	1.4	27.57	0.49	66.8	2.4	2.03	.08	27.2	0.4	29.14	.08	53.5	1.1
Apr. 10.4	38.46	.14	30.0	1.4	59.90	.13	27.4	1.1	27.08	0.59	69.2	2.0	1.95	.10	27.6	0.6	29.06	.10	54.6	1.1
20.4	38.32	.15	31.4	1.2	59.77	.15	28.5	0.8	26.49	0.67	71.2	1.5	1.85	.11	28.2	0.6	28.96	.12	55.7	1.0
30.3	38.17	.16	32.6	1.0	59.62	.15	29.3	0.4	25.82	0.72	72.7	1.0	1.74	.12	28.8	0.6	28.84	.13	56.7	0.9
May 10.3	38.01	.17	33.6	0.8	59.47	.16	29.7	0.0	25.10	0.74	73.7	0.5	1.62	.11	29.4	0.7	28.71	.12	57.6	0.8
20.3	37.84	.15	34.4	0.4	59.31	.16	29.7	0.3	24.36	0.73	74.2	0.1	1.51	.11	30.1	0.6	28.59	.13	58.4	0.7
30.3	37.69	.14	34.8	0.2	59.15	.14	29.4	0.7	23.63	0.70	74.1	0.6	1.40	.11	30.7	0.6	28.46	.11	59.1	0.5
June 9.2	37.55	.13	35.0	0.1	59.01	.14	28.7	1.0	22.93	0.64	73.5	1.2	1.29	.09	31.3	0.5	28.35	.11	59.6	0.3
19.2	37.42	.10	34.9	0.4	58.87	.12	27.7	1.3	22.29	0.57	72.3	1.6	1.20	.07	31.8	0.5	28.24	.09	59.9	0.1
29.2	37.32	.07	34.5	0.7	58.75	.10	26.4	1.5	21.72	0.48	70.7	2.1	1.13	.06	32.3	0.4	28.15	.07	60.0	0.1
July 9.1	37.25	.05	33.8	0.9	58.65	.08	24.9	1.7	21.24	0.38	68.6	2.4	1.07	.03	32.7	0.3	28.08	.04	59.9	0.3
19.1	37.20	.02	32.9	1.2	58.57	.05	23.2	1.9	20.86	0.26	66.2	2.8	1.04	.02	33.0	0.2	28.04	.03	59.6	0.5
29.1	37.18	.01	31.7	1.4	58.52	.03	21.3	2.0	20.60	0.15	63.4	3.1	1.02	.00	33.2	0.1	28.01	.00	59.1	0.7
Aug. 8.1	37.19	.04	30.3	1.6	58.49	.01	19.3	2.0	20.45	0.02	60.3	3.3	1.02	.03	33.3	0.1	28.01	.02	58.4	0.9
18.0	37.23	.07	28.7	1.9	58.50	.04	17.3	2.0	20.43	0.10	57.0	3.4	1.05	.06	33.2	0.3	28.03	.05	57.5	1.0
28.0	37.30	.11	26.8	2.0	58.54	.08	15.3	1.8	20.53	0.23	53.6	3.5	1.11	.09	32.9	0.4	28.08	.08	56.5	1.3
Sept. 7.0	37.41	.15	24.8	2.1	58.62	.11	13.5	1.6	20.76	0.37	50.1	3.5	1.20	.12	32.5	0.6	28.16	.12	55.2	1.5
17.0	37.56	.19	22.7	2.2	58.73	.16	11.9	1.3	21.13	0.49	46.6	3.5	1.32	.15	31.9	0.9	28.28	.15	53.7	1.6
26.9	37.75	.23	20.5	2.3	58.89	.20	10.6	1.0	21.62	0.61	43.1	3.3	1.47	.19	31.0	1.1	28.43	.19	52.1	1.8
Oct. 6.9	37.98	.27	18.2	2.4	59.09	.24	9.6	0.5	22.23	0.74	39.8	3.2	1.66	.22	29.9	1.3	28.62	.22	50.3	2.0
16.9	38.25	.30	15.8	2.3	59.33	.28	9.1	0.1	22.97	0.84	36.6	2.8	1.88	.25	28.6	1.5	28.84	.26	48.3	2.0
26.8	38.55	.34	13.5	2.3	59.61	.31	9.0	0.5	23.81	0.94	33.8	2.4	2.13	.28	27.1	1.7	29.10	.30	46.3	2.1
Nov. 5.8	38.89	.37	11.2	2.2	59.92	.33	9.5	0.9	24.75	1.02	31.4	2.0	2.41	.31	25.4	1.9	29.40	.32	44.2	2.1
15.8	39.26	.39	9.0	1.9	60.25	.35	10.4	1.4	25.77	1.07	29.4	1.6	2.72	.33	23.5	1.9	29.72	.34	42.1	2.1
25.8	39.65	.40	7.1	1.7	60.60	.36	11.8	1.9	26.84	1.11	27.8	1.0	3.05	.34	21.6	2.0	30.06	.36	40.0	2.0
Dec. 5.7	40.05	.40	5.4	1.4	60.96	.35	13.7	2.2	27.95	1.10	26.8	0.4	3.39	.34	19.6	2.0	30.42	.36	38.0	1.8
15.7	40.45	.39	4.0	1.0	61.31	.34	15.9	2.6	29.05	1.08	26.4	0.2	3.73	.33	17.6	1.9	30.78	.36	36.2	1.6
25.7	40.84	.37	3.0	0.6	61.65	.32	18.5	2.8	30.13	1.01	26.6	0.8	4.06	.31	15.7	1.7	31.14	.33	34.6	1.3
35.7	41.21		2.4		61.97		21.3		31.14		27.4		4.37		14.0		31.47		33.3	

(CONSTANTS OF STRUVE AND PETERS.)

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	η Argûs.				*l* Leonis.				δ² Chamæleontis.				46 Leonis Minoris.				Groombridge 1706.			
	Right Ascension.		Declination *South*.		Right Ascension.		Declination *North*.		Right Ascension.		Declination *South*.		Right Ascension.		Declination *North*.		Right Ascension.		Declination *North*.	
	h m 10 41		° ′ −59 12		h m 10 44		° ′ +11 1		h m 10 44		° ′ −80 3		h m 10 48		° ′ +34 41		h m 10 52		° ′ +78 14	
	s		″		s		″		s		″		s		″		s		″	
Jan. 0.7	32.16	.41	0.5	3.0	28.15	.30	38.2	1.6	59.64	1.01	12.9	2.8	13.23	.35	75.5	0.7	43.53	1.15	76.6	0.9
10.6	32.57	.35	3.5	3.4	28.45	.27	36.6	1.4	60.65	0.84	15.7	3.2	13.58	.32	74.8	0.3	44.68	1.03	77.5	1.5
20.6	32.92	.28	6.9	3.6	28.72	.23	35.2	1.1	61.49	0.64	18.9	3.5	13.90	.27	74.5	0.2	45.71	0.87	79.0	2.0
30.6	33.20	.21	10.5	3.7	28.95	.18	34.1	0.8	62.13	0.44	22.4	3.8	14.17	.22	74.7	0.5	46.58	0.70	81.0	2.4
Feb. 9.6	33.41	.12	14.2	3.7	29.13	.13	33.3	0.5	62.57	0.22	26.2	3.9	14.39	.16	75.2	0.9	47.28	0.50	83.4	2.8
19.5	33.53	.05	17.9	3.7	29.26	.09	32.8	0.2	62.79	0.01	30.1	3.9	14.55	.10	76.1	1.1	47.78	0.29	86.2	2.9
Mar. 1.5	33.58	.02	21.6	3.5	29.35	.04	32.6	0.0	62.80	0.19	34.0	3.8	14.65	.05	77.2	1.4	48.07	0.07	89.1	3.1
11.5	33.56	.10	25.1	3.3	29.39	.00	32.6	0.2	62.61	0.38	37.8	3.7	14.70	.00	78.6	1.5	48.14	0.13	92.2	3.0
21.5	33.46	.15	28.4	3.0	29.39	.04	32.8	0.4	62.23	0.56	41.5	3.5	14.70	.04	80.1	1.6	48.01	0.33	95.2	2.8
31.4	33.31	.20	31.4	2.6	29.35	.06	33.2	0.5	61.67	0.72	45.0	3.2	14.66	.08	81.7	1.6	47.68	0.49	98.0	2.6
Apr. 10.4	33.11	.25	34.0	2.3	29.29	.09	33.7	0.6	60.95	0.85	48.2	2.9	14.58	.11	83.3	1.5	47.19	0.64	100.6	2.2
20.4	32.86	.28	36.3	1.9	29.20	.10	34.3	0.7	60.10	0.97	51.1	2.4	14.47	.13	84.8	1.4	46.55	0.75	102.8	1.8
30.3	32.58	.30	38.2	1.4	29.10	.11	35.0	0.7	59.13	1.07	53.5	2.0	14.34	.15	86.2	1.1	45.80	0.82	104.6	1.3
May 10.3	32.28	.32	39.6	0.9	28.99	.11	35.7	0.7	58.06	1.13	55.5	1.4	14.19	.15	87.3	0.9	44.98	0.87	105.9	0.7
20.3	31.96	.33	40.5	0.4	28.88	.12	36.4	0.6	56.93	1.17	56.9	0.9	14.04	.15	88.2	0.7	44.11	0.88	106.6	0.2
30.3	31.63	.33	40.9	0.1	28.76	.10	37.0	0.6	55.76	1.19	57.8	0.4	13.89	.14	88.9	0.4	43.23	0.86	106.8	0.3
June 9.2	31.30	.32	40.8	0.6	28.66	.10	37.6	0.6	54.57	1.18	58.2	0.2	13.75	.12	89.3	0.1	42.37	0.82	106.5	0.9
19.2	30.98	.30	40.2	1.1	28.56	.08	38.2	0.4	53.39	1.13	58.0	0.7	13.63	.11	89.4	0.2	41.55	0.76	105.6	1.4
29.2	30.68	.28	39.1	1.5	28.48	.06	38.6	0.4	52.26	1.06	57.3	1.2	13.52	.09	89.2	0.5	40.79	0.66	104.2	1.9
July 9.2	30.40	.24	37.6	1.9	28.42	.05	39.0	0.2	51.20	0.95	56.1	1.7	13.43	.07	88.7	0.7	40.13	0.56	102.3	2.3
19.1	30.16	.20	35.7	2.3	28.37	.03	39.2	0.2	50.25	0.82	54.4	2.2	13.36	.04	88.0	1.0	39.57	0.44	100.0	2.8
29.1	29.96	.15	33.4	2.5	28.34	.01	39.4	0.0	49.43	0.67	52.2	2.5	13.32	.02	87.0	1.3	39.13	0.31	97.2	3.0
Aug. 8.1	29.81	.10	30.9	2.7	28.33	.02	39.4	0.2	48.76	0.48	49.7	2.8	13.30	.01	85.7	1.5	38.82	0.17	94.2	3.3
18.0	29.71	.03	28.2	2.9	28.35	.04	39.2	0.3	48.28	0.28	46.9	3.0	13.31	.04	84.2	1.7	38.65	0.02	90.9	3.5
28.0	29.68	.03	25.3	2.8	28.39	.07	38.9	0.6	48.00	0.06	43.9	3.1	13.35	.08	82.5	1.9	38.63	0.13	87.4	3.6
Sept. 7.0	29.71	.11	22.5	2.7	28.46	.10	38.3	0.7	47.94	0.17	40.8	3.1	13.43	.11	80.6	2.1	38.76	0.28	83.8	3.6
17.0	29.82	.18	19.8	2.5	28.56	.14	37.6	1.0	48.11	0.39	37.7	2.9	13.54	.16	78.5	2.2	39.04	0.43	80.2	3.6
26.9	30.00	.26	17.3	2.2	28.70	.17	36.6	1.2	48.50	0.61	34.8	2.7	13.70	.19	76.3	2.4	39.47	0.59	76.6	3.5
Oct. 6.9	30.26	.32	15.1	1.7	28.87	.21	35.4	1.4	49.11	0.82	32.1	2.3	13.89	.23	73.9	2.4	40.06	0.74	73.1	3.4
16.9	30.58	.39	13.4	1.3	29.08	.24	34.0	1.6	49.93	1.00	29.8	1.8	14.12	.28	71.5	2.4	40.80	0.87	69.7	3.1
26.9	30.97	.45	12.1	0.7	29.32	.28	32.4	1.8	50.93	1.15	28.0	1.2	14.40	.31	69.1	2.4	41.67	1.00	66.6	2.8
Nov. 5.8	31.42	.49	11.4	0.0	29.60	.30	30.6	1.9	52.08	1.25	26.8	0.7	14.71	.34	66.7	2.4	42.67	1.11	63.8	2.3
15.8	31.91	.51	11.4	0.6	29.90	.32	28.7	2.0	53.33	1.31	26.1	0.0	15.05	.37	64.3	2.2	43.78	1.19	61.5	1.9
25.8	32.42	.52	12.0	1.2	30.22	.34	26.7	2.0	54.64	1.33	26.1	0.7	15.42	.39	62.1	2.0	44.97	1.25	59.6	1.3
Dec. 5.7	32.94	.52	13.2	1.8	30.56	.34	24.7	2.1	55.97	1.30	26.8	1.3	15.81	.40	60.1	1.7	46.22	1.27	58.3	0.7
15.7	33.46	.49	15.0	2.3	30.90	.34	22.6	1.9	57.27	1.22	28.1	1.9	16.21	.39	58.4	1.3	47.49	1.25	57.6	0.2
25.7	33.95	.45	17.3	2.8	31.24	.32	20.7	1.8	58.49	1.10	30.0	2.5	16.60	.37	57.1	1.0	48.74	1.20	57.4	0.5
35.7	34.40		20.1		31.56		18.9		59.59		32.5		16.97		56.1		49.94		57.9	

(CONSTANTS OF STRUVE AND PETERS.)

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Ursæ Majoris.				η Octantis.				p^3 Leonis.				ψ Ursæ Majoris.				δ Leonis.			
	Right Ascension.		Declination North.		Right Ascension.		Declination South.		Right Ascension.		Declination North.		Right Ascension.		Declination North.		Right Ascension.		Declination North.	
	h m 10 58		° ′ +62 14		h m 10 59		° ′ −84 5		h m 11 2		° ′ + 2 26		h m 11 4		° ′ +44 59		h m 11 9		° ′ +21 0	
	s		″		s		″		s		″		s		″		s		″	
Jan. 0.7	7.32		22.3		63.44		50.9		15.29		63.5		32.81		25.0		15.76		79.0	
		.57		0.3		1.72		2.5		.30		2.0		.41		0.4		.33		1.4
10.7	7.89		22.6		65.16		53.4		15.59		61.5		33.22		24.6		16.09		77.6	
		.51		0.8		1.46		3.0		.27		1.8		.37		0.1		.30		1.0
20.6	8.40		23.4		66.62		56.4		15.86		59.7		33.59		24.7		16.39		76.6	
		.44		1.4		1.15		3.4		.23		1.6		.32		0.5		.26		0.7
30.6	8.84		24.8		67.77		59.8		16.09		58.1		33.91		25.2		16.65		75.9	
		.35		1.8		0.82		3.6		.19		1.3		.26		1.0		.21		0.3
Feb. 9.6	9.19		26.6		68.59		63.4		16.28		56.8		34.17		26.2		16.86		75.6	
		.27		2.2		0.49		3.9		.15		1.1		.20		1.4		.17		0.0
19.5	9.46		28.8		69.08		67.3		16.43		55.7		34.37		27.6		17.03		75.6	
		.17		2.5		0.14		3.9		.10		0.8		.14		1.6		.12		0.3
Mar. 1.5	9.63		31.3		69.22		71.2		16.53		54.9		34.51		29.2		17.15		75.9	
		.07		2.6		0.20		3.9		.06		0.5		.08		1.9		.07		0.6
11.5	9.70		33.9		69.02		75.1		16.59		54.4		34.59		31.1		17.22		76.5	
		.02		2.7		0.53		3.8		.01		0.3		.01		2.1		.03		0.8
21.5	9.68		36.6		68.49		78.9		16.60		54.1		34.60		33.2		17.25		77.3	
		.10		2.6		0.82		3.6		.02		0.1		.04		2.1		.02		1.0
31.4	9.58		39.2		67.67		82.5		16.58		54.0		34.56		35.3		17.23		78.3	
		.17		2.4		1.11		3.4		.05		0.1		.09		2.0		.05		1.0
Apr. 10.4	9.41		41.6		66.56		85.9		16.53		54.1		34.47		37.3		17.18		79.3	
		.23		2.2		1.36		3.0		.07		0.2		.12		1.9		.07		1.1
20.4	9.18		43.8		65.20		88.9		16.46		54.3		34.35		39.2		17.11		80.4	
		.28		1.8		1.58		2.7		.09		0.4		.15		1.7		.09		1.1
30.4	8.90		45.6		63.62		91.6		16.37		54.7		34.20		40.9		17.02		81.5	
		.31		1.5		1.75		2.2		.10		0.5		.17		1.4		.11		1.0
May 10.3	8.59		47.1		61.87		93.8		16.27		55.2		34.03		42.3		16.91		82.5	
		.33		1.0		1.89		1.8		.10		0.5		.19		1.1		.12		0.9
20.3	8.26		48.1		59.98		95.6		16.17		55.7		33.84		43.4		16.79		83.4	
		.33		0.5		2.00		1.2		.11		0.6		.18		0.7		.11		0.8
30.3	7.93		48.6		57.98		96.8		16.06		56.3		33.66		44.1		16.68		84.2	
		.32		0.0		2.04		0.7		.10		0.7		.18		0.4		.11		0.6
June 9.2	7.61		48.6		55.94		97.5		15.96		57.0		33.48		44.5		16.57		84.8	
		.30		0.4		2.04		0.1		.10		0.6		.17		0.0		.11		0.5
19.2	7.31		48.2		53.90		97.6		15.86		57.6		33.31		44.5		16.46		85.3	
		.28		0.9		2.00		0.4		.09		0.6		.15		0.3		.10		0.2
29.2	7.03		47.3		51.90		97.2		15.77		58.2		33.16		44.2		16.36		85.5	
		.24		1.4		1.89		0.9		.07		0.6		.13		0.7		.08		0.1
July 9.2	6.79		45.9		50.01		96.3		15.70		58.8		33.03		43.5		16.28		85.6	
		.20		1.8		1.74		1.5		.06		0.6		.11		1.1		.07		0.1
19.1	6.59		44.1		48.27		94.8		15.64		59.4		32.92		42.4		16.21		85.5	
		.15		2.1		1.54		2.0		.05		0.5		.08		1.4		.05		0.3
29.1	6.44		42.0		46.73		92.8		15.59		59.9		32.84		41.0		16.16		85.2	
		.10		2.5		1.28		2.3		.03		0.4		.05		1.7		.03		0.5
Aug. 8.1	6.34		39.5		45.45		90.5		15.56		60.3		32.79		39.3		16.13		84.7	
		.05		2.7		0.98		2.7		.00		0.3		.02		2.0		.01		0.8
18.1	6.29		36.8		44.47		87.8		15.56		60.6		32.77		37.3		16.12		83.9	
		.01		3.0		0.64		2.9		.02		0.1		.02		2.2		.02		0.9
28.0	6.30		33.8		43.83		84.9		15.58		60.7		32.79		35.1		16.14		83.0	
		.08		3.1		0.28		3.1		.05		0.0		.06		2.5		.05		1.2
Sept. 7.0	6.38		30.7		43.55		81.8		15.63		60.7		32.85		32.6		16.19		81.8	
		.14		3.3		0.10		3.1		.08		0.2		.10		2.6		.08		1.3
17.0	6.52		27.4		43.65		78.7		15.71		60.5		32.95		30.0		16.27		80.5	
		.21		3.4		0.49		3.0		.12		0.5		.14		2.7		.11		1.6
26.9	6.73		24.0		44.14		75.7		15.83		60.0		33.09		27.3		16.38		78.9	
		.28		3.3		0.87		2.8		.15		0.8		.20		2.8		.16		1.8
Oct. 6.9	7.01		20.7		45.01		72.9		15.98		59.2		33.29		24.5		16.54		77.1	
		.35		3.2		1.23		2.5		.18		1.0		.24		2.9		.19		1.9
16.9	7.36		17.5		46.24		70.4		16.16		58.2		33.53		21.6		16.73		75.2	
		.41		3.1		1.54		2.0		.23		1.3		.28		2.8		.23		2.1
26.9	7.77		14.4		47.78		68.4		16.39		56.9		33.81		18.8		16.96		73.1	
		.47		2.9		1.80		1.5		.26		1.5		.34		2.8		.27		2.2
Nov. 5.8	8.24		11.5		49.58		66.9		16.65		55.4		34.15		16.0		17.23		70.9	
		.53		2.5		2.00		0.9		.29		1.7		.37		2.6		.30		2.2
15.8	8.77		9.0		51.58		66.0		16.94		53.7		34.52		13.4		17.53		68.7	
		.57		2.2		2.13		0.3		.31		1.9		.40		2.3		.33		2.3
25.8	9.34		6.8		53.71		65.7		17.25		51.8		34.92		11.1		17.86		66.4	
		.60		1.7		2.17		0.4		.33		2.1		.43		2.0		.34		2.1
Dec. 5.8	9.94		5.1		55.88		66.1		17.58		49.7		35.35		9.1		18.20		64.3	
		.61		1.2		2.14		1.0		.34		2.1		.44		1.7		.36		2.1
15.7	10.55		3.9		58.02		67.1		17.92		47.6		35.79		7.4		18.56		62.2	
		.61		0.7		2.04		1.7		.33		2.2		.44		1.2		.36		1.8
25.7	11.16		3.2		60.06		68.8		18.25		45.4		36.23		6.2		18.92		60.4	
		.59		0.1		1.86		2.2		.32		2.0		.43		0.8		.34		1.6
35.7	11.75		3.1		61.92		71.0		18.57		43.4		36.66		5.4		19.26		58.8	

(CONSTANTS OF STRUVE AND PETERS.)

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	ν Ursæ Majoris.				δ Crateris.				τ Leonis.				λ Draconis.				ξ Hydræ.			
	Right Ascension.		Declination *North*.		Right Ascension.		Declination *South*.		Right Ascension.		Declination *North*.		Right Ascension.		Declination *North*.		Right Ascension.		Declination *South*.	
	h m 11 13		° ′ +33 35		h m 11 14		° ′ −14 16		h m 11 23		° ′ + 3 21		h m 11 25		° ′ +69 49		h m 11 28		° ′ −31 20	
	s		″		s		″		s		″		s		″		s		″	
Jan. 0.7	33.54	.36	22.5	1.0	46.89	.31	59.6	2.4	14.88	.32	31.1	2.0	60.93	.75	48.2	0.2	30.91	.34	59.2	2.6
10.7	33.90	.32	21.5	0.5	47.20	.28	62.0	2.4	15.20	.28	29.1	1.8	61.68	.69	48.4	0.8	31.25	.31	61.8	2.8
20.7	34.22	.29	21.0	0.1	47.48	.24	64.4	2.3	15.48	.26	27.3	1.6	62.37	.61	49.2	1.4	31.56	.26	64.6	2.9
30.6	34.51	.24	20.9	0.4	47.72	.20	66.7	2.2	15.74	.21	25.7	1.3	62.98	.52	50.6	1.8	31.82	.22	67.5	2.8
Feb. 9.6	34.75	.19	21.3	0.7	47.92	.15	68.9	2.0	15.95	.17	24.4	1.0	63.50	.41	52.4	2.3	32.04	.18	70.3	2.8
19.6	34.94	.14	22.0	1.0	48.07	.11	70.9	1.8	16.12	.12	23.4	0.8	63.91	.28	54.7	2.6	32.22	.12	73.1	2.7
Mar. 1.5	35.08	.08	23.0	1.3	48.18	.07	72.7	1.6	16.24	.08	22.6	0.5	64.19	.15	57.3	2.8	32.34	.08	75.8	2.5
11.5	35.16	.03	24.3	1.5	48.25	.02	74.3	1.3	16.32	.03	22.1	0.3	64.34	.04	60.1	2.9	32.42	.03	78.3	2.3
21.5	35.19	.02	25.8	1.6	48.27	.01	75.6	1.1	16.35	.00	21.8	0.0	64.38	.09	63.0	2.9	32.45	.01	80.6	2.0
31.5	35.17	.05	27.4	1.7	48.26	.04	76.7	0.8	16.35	.03	21.8	0.2	64.29	.19	65.9	2.7	32.44	.04	82.6	1.8
Apr. 10.4	35.12	.09	29.1	1.6	48.22	.07	77.5	0.6	16.32	.05	22.0	0.3	64.10	.28	68.6	2.5	32.40	.07	84.4	1.5
20.4	35.03	.11	30.7	1.5	48.15	.08	78.1	0.3	16.27	.07	22.3	0.4	63.82	.36	71.1	2.1	32.33	.09	85.9	1.1
30.4	34.92	.13	32.2	1.3	48.07	.10	78.4	0.1	16.20	.09	22.7	0.5	63.46	.41	73.2	1.8	32.24	.12	87.0	0.9
May 10.4	34.79	.14	33.5	1.1	47.97	.11	78.5	0.1	16.11	.10	23.2	0.6	63.05	.46	75.0	1.2	32.12	.12	87.9	0.5
20.3	34.65	.14	34.6	0.8	47.86	.11	78.4	0.3	16.01	.10	23.8	0.6	62.59	.47	76.2	0.8	32.00	.14	88.4	0.1
30.3	34.51	.14	35.4	0.6	47.75	.11	78.1	0.5	15.91	.10	24.4	0.6	62.12	.48	77.0	0.2	31.86	.14	88.5	0.1
June 9.3	34.37	.13	36.0	0.3	47.64	.11	77.6	0.7	15.81	.10	25.0	0.7	61.64	.47	77.2	0.3	31.72	.14	88.4	0.4
19.2	34.24	.12	36.3	0.0	47.53	.10	76.9	0.8	15.71	.09	25.7	0.6	61.17	.44	76.9	0.8	31.58	.13	88.0	0.8
29.2	34.12	.10	36.3	0.3	47.43	.09	76.1	0.9	15.62	.08	26.3	0.6	60.73	.40	76.1	1.3	31.45	.13	87.2	1.0
July 9.2	34.02	.09	36.0	0.6	47.34	.08	75.2	1.1	15.54	.07	26.9	0.5	60.33	.36	74.8	1.8	31.32	.12	86.2	1.3
19.2	33.93	.07	35.4	0.8	47.26	.07	74.1	1.1	15.47	.06	27.4	0.4	59.97	.30	73.0	2.2	31.20	.10	84.9	1.5
29.1	33.86	.04	34.6	1.2	47.19	.05	73.0	1.1	15.41	.05	27.8	0.4	59.67	.24	70.8	2.6	31.10	.09	83.4	1.6
Aug. 8.1	33.82	.02	33.4	1.4	47.14	.02	71.9	1.1	15.36	.02	28.2	0.2	59.43	.16	68.2	2.9	31.01	.06	81.8	1.8
18.1	33.80	.01	32.0	1.6	47.12	.00	70.8	1.1	15.34	.00	28.4	0.0	59.27	.09	65.3	3.1	30.95	.03	80.0	1.8
28.1	33.81	.05	30.4	1.8	47.12	.03	69.7	0.9	15.34	.03	28.4	0.1	59.18	.01	62.2	3.4	30 92	.01	78.2	1.7
Sept. 7.0	33.86	.08	28.6	2.1	47.15	.07	68.8	0.7	15.37	.06	28.3	0.3	59.17	.09	58.8	3.6	30.93	.04	76.5	1.6
17.0	33.94	.12	26.5	2.2	47.22	.10	68.1	0.5	15.43	.10	28.0	0.6	59.26	.17	55.2	3.6	30.97	.09	74.9	1.5
27.0	34.06	.16	24.3	2.4	47.32	.14	67.6	0.2	15.53	.13	27.4	0.8	59.43	.27	51.6	3.6	31.06	.13	73.4	1.1
Oct. 6.9	34.22	.20	21.9	2.5	47.46	.18	67.4	0.1	15.66	.17	26.6	1.0	59.70	.36	48.0	3.5	31.19	.18	72.3	0.9
16.9	34.42	.24	19.4	2.6	47.64	.22	67.5	0.4	15.83	.21	25.6	1.4	60.06	.46	44.5	3.4	31.37	.23	71.4	0.4
26.9	34.66	.29	16.8	2.6	47.86	.25	67.9	0.8	16.04	.25	24.2	1.5	60.52	.55	41.1	3.2	31.60	.27	71.0	0.0
Nov. 5.9	34.95	.33	14.2	2.5	48.11	.29	68.7	1.2	16.29	.28	22.7	1.8	61.07	.62	37.9	2.8	31.87	.31	71.0	0.5
15.8	35.28	.35	11.7	2.4	48.40	.32	69.9	1.6	16.57	.30	20.9	2.0	61.69	.70	35.1	2.4	32.18	.34	71.5	0.9
25.8	35.63	.37	9.3	2.2	48.72	.33	71.5	1.8	16.87	.33	18.9	2.1	62.39	.74	32.7	2.0	32.52	.36	72.4	1.4
Dec. 5.8	36.00	.39	7.1	1.9	49.05	.34	73.3	2.1	17.20	.34	16.8	2.1	63.13	.78	30.7	1.4	32.88	.37	73.8	1.8
15.7	36.39	.39	5.2	1.6	49.39	.34	75.4	2.3	17.54	.33	14.7	2.2	63.91	.78	29.3	0.9	33.25	.37	75.6	2.2
25.7	36.78	.38	3.6	1.2	49.73	.33	77.7	2.3	17.87	.33	12.5	2.1	64.69	.77	28.4	0.2	33.62	.35	77.8	2.5
35.7	37.16		2.4		50.06		80.0		18.20		10.4		65.46		28.2		33.97		80.3	

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	υ Leonis.				χ Ursæ Majoris.				β Leonis.				γ Ursæ Majoris.				π Virginis.			
	Right Ascension.		Declination *South.*		Right Ascension.		Declination *North.*		Right Ascension.		Declination *North.*		Right Ascension.		Declination *North.*		Right Ascension.		Declination *North.*	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	11 32		− 0 19		11 41		+48 16		11 44		+15 4		11 49		+54 11		11 56		+ 7 6	
	s		″		s		″		s		″		s		″		s		″	
Jan. 0.7	16.74	.31	11.2	2.1	14.47	.44	53.3	0.7	24.46	.33	50.9	1.7	2.47	.49	52.2	0.6	11.82	.33	81.0	2.0
10.7	17.05	.29	13.3	1.9	14.91	.41	52.6	0.2	24.79	.31	49.2	1.5	2.96	.46	51.6	0.0	12.15	.30	79.0	1.7
20.7	17.34	.26	15.2	1.8	15.32	.37	52.4	0.4	25.10	.27	47.7	1.1	3.42	.42	51.6	0.5	12.45	.28	77.3	1.5
30.6	17.60	.21	17.0	1.5	15.69	.32	52.8	0.9	25.37	.24	46.6	0.8	3.84	.36	52.1	1.1	12.73	.24	75.8	1.3
Feb. 9.6	17.81	.18	18.5	1.3	16.01	.26	53.7	1.3	25.61	.19	45.8	0.4	4.20	.29	53.2	1.5	12.97	.20	74.5	0.9
19.6	17.99	.13	19.8	1.0	16.27	.19	55.0	1.7	25.80	.15	45.4	0.2	4.49	.23	54.7	1.9	13.17	.15	73.6	0.6
Mar. 1.5	18.12	.08	20.8	0.7	16.46	.13	56.7	2.0	25.95	.10	45.2	0.2	4.72	.15	56.6	2.3	13.32	.11	73.0	0.3
11.5	18.20	.05	21.5	0.5	16.59	.06	58.7	2.2	26.05	.06	45.4	0.5	4.87	.08	58.9	2.4	13.43	.07	72.7	0.0
21.5	18.25	.01	22.0	0.3	16.65	.01	60.9	2.3	26.11	.02	45.9	0.6	4.95	.01	61.3	2.5	13.50	.04	72.7	0.2
31.5	18.26	.02	22.3	0.0	16.66	.05	63.2	2.3	26.13	.01	46.5	0.8	4.96	.05	63.8	2.5	13.54	.00	72.9	0.3
Apr. 10.4	18.24	.05	22.3	0.1	16.61	.10	65.5	2.2	26.12	.04	47.3	0.9	4.91	.11	66.3	2.4	13.54	.03	73.2	0.6
20.4	18.19	.07	22.2	0.3	16.51	.13	67.7	2.0	26.08	.07	48.2	1.0	4.80	.15	68.7	2.2	13.51	.05	73.8	0.6
30.4	18.12	.08	21.9	0.4	16.38	.16	69.7	1.7	26.01	.08	49.2	1.0	4.65	.19	70.9	1.9	13.46	.07	74.4	0.7
May 10.4	18.04	.09	21.5	0.4	16.22	.18	71.4	1.5	25.93	.09	50.2	0.9	4.46	.22	72.8	1.5	13.39	.08	75.1	0.7
20.3	17.95	.10	21.1	0.6	16.04	.20	72.9	1.1	25.84	.10	51.1	0.8	4.24	.23	74.3	1.2	13.31	.09	75.8	0.8
30.3	17.85	.10	20.5	0.6	15.84	.20	74.0	0.7	25.74	.11	51.9	0.8	4.01	.23	75.5	0.7	13.22	.09	76.6	0.7
June 9.3	17.75	.10	19.9	0.6	15.64	.19	74.7	0.3	25.63	.10	52.7	0.6	3.78	.24	76.2	0.3	13.13	.10	77.3	0.6
19.2	17.65	.09	19.3	0.7	15.45	.19	75.0	0.2	25.53	.10	53.3	0.5	3.54	.23	76.5	0.2	13.03	.10	77.9	0.6
29.2	17.56	.09	18.6	0.6	15.26	.17	74.8	0.5	25.43	.10	53.8	0.3	3.31	.22	76.3	0.6	12.93	.09	78.5	0.5
July 9.2	17.47	.08	18.0	0.6	15.09	.16	74.3	0.9	25.33	.09	54.1	0.2	3.09	.19	75.7	1.1	12.84	.09	79.0	0.4
19.2	17.39	.06	17.4	0.6	14.93	.13	73.4	1.3	25.24	.07	54.3	0.0	2.90	.18	74.6	1.5	12.75	.08	79.4	0.3
29.1	17.33	.05	16.8	0.5	14.80	.11	72.1	1.7	25.17	.06	54.3	0.2	2.72	.14	73.1	1.9	12.67	.06	79.7	0.2
Aug. 8.1	17.28	.03	16.3	0.4	14.69	.07	70.4	2.0	25.11	.04	54.1	0.4	2.58	.10	71.2	2.2	12.61	.05	79.9	0.0
18.1	17.25	.01	15.9	0.2	14.62	.04	68.4	2.3	25.07	.02	53.7	0.6	2.48	.07	69.0	2.5	12.56	.03	79.9	0.2
28.1	17.24	.02	15.7	0.1	14.58	.00	66.1	2.6	25.05	.01	53.1	0.8	2.41	.02	66.5	2.8	12.53	.00	79.7	0.3
Sept. 7.0	17.26	.05	15.6	0.1	14.58	.04	63.5	2.8	25.06	.04	52.3	1.0	2.39	.03	63.7	3.0	12.53	.03	79.4	0.6
17.0	17.31	.09	15.7	0.3	14.62	.10	60.7	2.9	25.10	.08	51.3	1.3	2.42	.08	60.7	3.2	12.56	.06	78.8	0.8
27.0	17.40	.12	16.0	0.6	14.72	.14	57.8	3.1	25.18	.11	50.0	1.5	2.50	.14	57.5	3.3	12.62	.10	78.0	1.1
Oct. 6.9	17.52	.16	16.6	0.9	14.86	.20	54.7	3.2	25.29	.15	48.5	1.7	2.64	.21	54.2	3.4	12.72	.14	76.9	1.3
16.9	17.68	.20	17.5	1.1	15.06	.25	51.5	3.1	25.44	.20	46.8	2.0	2.85	.26	50.8	3.3	12.86	.18	75.6	1.5
26.9	17.88	.24	18.6	1.4	15.31	.30	48.4	3.1	25.64	.23	44.8	2.1	3.11	.32	47.5	3.3	13.04	.22	74.1	1.8
Nov. 5.9	18.12	.28	20.0	1.7	15.61	.35	45.3	2.9	25.87	.27	42.7	2.2	3.43	.38	44.2	3.0	13.26	.26	72.3	1.9
15.8	18.40	.30	21.7	1.9	15.96	.40	42.4	2.7	26.14	.30	40.5	2.2	3.81	.42	41.2	2.8	13.52	.29	70.4	2.1
25.8	18.70	.32	23.6	2.0	16.36	.43	39.7	2.4	26.44	.33	38.3	2.3	4.23	.47	38.4	2.4	13.81	.32	68.3	2.2
Dec. 5.8	19.02	.34	25.6	2.2	16.79	.45	37.3	2.0	26.77	.34	36.0	2.3	4.70	.49	36.0	2.1	14.13	.33	66.1	2.3
15.7	19.36	.34	27.8	2.2	17.24	.45	35.3	1.6	27.11	.35	33.7	2.1	5.19	.51	33.9	1.5	14.46	.34	63.8	2.1
25.7	19.70	.33	30.0	2.1	17.69	.46	33.7	1.1	27.46	.34	31.6	1.9	5.70	.50	32.4	1.0	14.80	.34	61.7	2.1
35.7	20.03		32.1		18.15		32.6		27.80		29.7		6.20		31.4		15.14		59.6	

(CONSTANTS OF STRUVE AND PETERS.)

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	*o* Virginis.				*ε* Corvi.				4 Draconis (H.).				*γ* Corvi.				2 Canum Venat.			
	Right Ascension.		Declination North.		Right Ascension.		Declination South.		Right Ascension.		Declination North.		Right Ascension.		Declination South.		Right Ascension.		Declination North.	
	h m 12 0		° ′ + 9 13		h m 12 5		° ′ −22 6		h m 12 7		° ′ +78 6		h m 12 11		° ′ −17 2		h m 12 11		° ′ +41 9	
	s		″		s		″		s		″		s		″		s		″	
Jan. 0.7	33.66	.33	80.0	1.9	25.74	.33	36.4	2.4	56.89	1.21	65.4	0.2	6.59	.33	0.7	2.3	33.46	.40	51.9	1.2
10.7	33.99	.31	78.1	1.7	26.07	.32	38.8	2.4	58.10	1.16	65.2	0.5	6.92	.31	3.0	2.3	33.86	.39	50.7	0.7
20.7	34.30	.28	76.4	1.5	26.39	.28	41.2	2.5	59.26	1.06	65.7	1.1	7.23	.29	5.3	2.3	34.25	.35	50.0	0.2
30.7	34.58	.24	74.9	1.1	26.67	.25	43.7	2.4	60.32	0.94	66.8	1.7	7.52	.25	7.6	2.3	34.60	.32	49.8	0.3
Feb. 9.6	34.82	.20	73.8	0.8	26.92	.21	46.1	2.4	61.26	0.79	68.5	2.1	7.77	.21	9.9	2.1	34.92	.27	50.1	0.7
19.6	35.02	.16	73.0	0.5	27.13	.16	48.5	2.2	62.05	0.60	70.6	2.6	7.98	.17	12.0	1.9	35.19	.21	50.8	1.2
Mar. 1.6	35.18	.12	72.5	0.2	27.29	.12	50.7	2.0	62.65	0.41	73.2	2.9	8.15	.12	13.9	1.8	35.40	.16	52.0	1.6
11.5	35.30	.08	72.3	0.1	27.41	.08	52.7	1.8	63.06	0.20	76.1	3.0	8.27	.08	15.7	1.5	35.56	.10	53.6	1.9
21.5	35.38	.04	72.4	0.3	27.49	.04	54.5	1.6	63.26	0.00	79.1	3.1	8.35	.05	17.2	1.3	35.66	.04	55.5	2.0
31.5	35.42	.00	72.7	0.5	27.53	.01	56.1	1.3	63.26	0.19	82.2	3.0	8.40	.02	18.5	1.0	35.70	.00	57.5	2.1
Apr. 10.5	35.42	.02	73.2	0.6	27.54	.02	57.4	1.1	63.07	0.36	85.2	2.7	8.42	.02	19.5	0.8	35.70	.04	59.6	2.1
20.4	35.40	.05	73.8	0.8	27.52	.05	58.5	0.9	62.71	0.52	87.9	2.5	8.40	.04	20.3	0.6	35.66	.08	61.7	2.0
30.4	35.35	.07	74.6	0.8	27.47	.07	59.4	0.6	62.19	0.65	90.4	2.1	8.36	.06	20.9	0.4	35.58	.11	63.7	1.9
May 10.4	35.28	.08	75.4	0.8	27.40	.08	60.0	0.3	61.54	0.75	92.5	1.7	8.30	.07	21.3	0.2	35.47	.13	65.6	1.6
20.4	35.20	.09	76.2	0.8	27.32	.10	60.3	0.1	60.79	0.82	94.2	1.1	8.23	.09	21.5	0.1	35.34	.14	67.2	1.3
30.3	35.11	.09	77.0	0.7	27.22	.11	60.4	0.1	59.97	0.86	95.3	0.6	8.14	.10	21.4	0.2	35.20	.16	68.5	1.0
June 9.3	35.02	.10	77.7	0.7	27.11	.11	60.3	0.3	59.11	0.88	95.9	0.1	8.04	.10	21.2	0.4	35.04	.16	69.5	0.7
19.3	34.92	.10	78.4	0.6	27.00	.12	60.0	0.6	58.23	0.88	96.0	0.5	7.94	.11	20.8	0.6	34.88	.16	70.2	0.3
29.2	34.82	.10	79.0	0.5	26.88	.11	59.4	0.8	57.35	0.84	95.5	1.1	7.83	.11	20.2	0.7	34.72	.16	70.5	0.1
July 9.2	34.72	.09	79.5	0.3	26.77	.11	58.6	0.9	56.51	0.79	94.4	1.5	7.72	.11	19.5	0.8	34.56	.15	70.4	0.5
19.2	34.63	.08	79.8	0.2	26.66	.11	57.7	1.1	55.72	0.71	92.9	2.0	7.61	.10	18.7	1.0	34.41	.13	69.9	0.8
29.2	34.55	.07	80.0	0.1	26.55	.09	56.6	1.2	55.01	0.62	90.9	2.5	7.51	.08	17.7	1.0	34.28	.12	69.1	1.2
Aug. 8.1	34.48	.05	80.1	0.1	26.46	.07	55.4	1.2	54.39	0.52	88.4	2.9	7.43	.08	16.7	1.0	34.16	.09	67.9	1.6
18.1	34.43	.03	80.0	0.3	26.39	.05	54.2	1.2	53.87	0.40	85.5	3.2	7.35	.05	15.7	1.0	34.07	.07	66.3	1.9
28.1	34.40	.00	79.7	0.5	26.34	.03	53.0	1.2	53.47	0.27	82.3	3.4	7.30	.02	14.7	1.0	34.00	.03	64.4	2.1
Sept. 7.1	34.40	.02	79.2	0.7	26.31	.01	51.8	1.1	53.20	0.12	78.9	3.7	7.28	.01	13.7	0.8	33.97	.00	62.3	2.5
17.0	34.42	.06	78.5	0.9	25.32	.05	50.7	1.0	53.08	0.02	75.2	3.8	7.29	.04	12.9	0.6	33.97	.04	59.8	2.6
27.0	34.48	.09	77.6	1.2	26.37	.09	49.7	0.7	53.10	0.19	71.4	3.8	7.33	.08	12.3	0.4	34.01	.09	57.2	2.9
Oct. 7.0	34.57	.13	76.4	1.4	26.46	.14	49.0	0.4	53.29	0.35	67.6	3.9	7.41	.13	11.9	0.2	34.10	.14	54.3	3.0
16.9	34.70	.18	75.0	1.6	26.60	.18	48.6	0.1	53.64	0.51	63.7	3.7	7.54	.18	11.7	0.2	34.24	.19	51.3	3.1
26.9	34.88	.22	73.4	1.9	26.78	.23	48.5	0.3	54.15	0.66	60.0	3.5	7.72	.21	11.9	0.6	34.43	.25	48.2	3.1
Nov. 5.9	35.10	.25	71.5	2.0	27.01	.27	48.8	0.7	54.81	0.82	56.5	3.2	7.93	.26	12.5	0.9	34.68	.29	45.1	3.0
15.9	35.35	.29	69.5	2.2	27.28	.30	49.5	1.0	55.63	0.96	53.3	2.8	8.19	.29	13.4	1.2	34.97	.33	42.1	2.9
25.8	35.64	.32	67.3	2.2	27.58	.33	50.5	1.5	56.59	1.07	50.5	2.4	8.48	.32	14.6	1.5	35.30	.37	39.2	2.7
Dec. 5.8	35.96	.34	65.1	2.2	27.91	.35	52.0	1.7	57.66	1.15	48.1	1.8	8.80	.34	16.1	1.9	35.67	.40	36.5	2.4
15.8	36.30	.34	62.9	2.2	28.26	.35	53.7	2.1	58.81	1.20	46.3	1.2	9.14	.35	18.0	2.1	36.07	.41	34.1	2.0
25.8	36.64	.34	60.7	2.1	28.61	.35	55.8	2.3	60.01	1.22	45.1	0.6	9.49	.34	20.1	2.2	36.48	.42	32.1	1.5
35.7	36.98		58.6		28.96		58.1		61.23		44.5		9.83		22.3		36.90		30.6	

(CONSTANTS OF STRUVE AND PETERS.)

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	β Chamæleontis.				η Virginis.				α¹ Crucis.				δ² Corvi.				β Canum Venat.			
	Right Ascension.		Declination *South.*		Right Ascension.		Declination *South.*		Right Ascension.		Declination *South.*		Right Ascension.		Declination *South.*		Right Ascension.		Declination *North.*	
	h m 12 12 s		° ' −78 47 "		h m 12 15 s		° ' − 0 9 "		h m 12 21 s		° ' −62 35 "		h m 12 25 s		° ' −16 0 "		h m 12 29 s		° ' +41 50 "	
Jan. 0.7	58.78	1.18	58.8	1.7	14.13	.33	34.9	2.1	30.77	.57	17.5	2.0	8.30	.34	21.2	2.2	24.61	.41	58.4	1.4
10.7	59.96	1.09	60.5	2.3	14.46	.31	37.0	2.0	31.34	.53	19.5	2.4	8.64	.31	23.4	2.3	25.02	.39	57.0	0.8
20.7	61.05	0.98	62.8	2.8	14.77	.28	39.0	1.8	31.87	.49	21.9	2.8	8.95	.30	25.7	2.3	25.41	.37	56.2	0.4
30.7	62.03	0.84	65.6	3.2	15.05	.25	40.8	1.6	32.36	.42	24.7	3.2	9.25	.26	28.0	2.2	25.78	.33	55.8	0.2
Feb. 9.6	62.87	0.69	68.8	3.5	15.30	.21	42.4	1.3	32.78	.35	27.9	3.4	9.51	.22	30.2	2.0	26.11	.28	56.0	0.7
19.6	63.56	0.52	72.3	3.7	15.51	.17	43.7	1.1	33.13	.28	31.3	3.5	9.73	.18	32.2	1.9	26.39	.23	56.7	1.2
Mar. 1.6	64.08	0.34	76.0	3.8	15.68	.13	44.8	0.7	33.41	.21	34.8	3.5	9.91	.14	34.1	1.7	26.62	.18	57.9	1.5
11.5	64.42	0.18	79.8	3.8	15.81	.09	45.5	0.5	33.62	.13	38.3	3.6	10.05	.10	35.8	1.4	26.80	.12	59.4	1.8
21.5	64.60	0.01	83.6	3.8	15.90	.06	46.0	0.3	33.75	.06	41.9	3.4	10.15	.06	37.2	1.3	26.92	.07	61.2	2.1
31.5	64.61	0.16	87.4	3.7	15.96	.02	46.3	0.1	33.81	.01	45.3	3.3	10.21	.03	38.5	1.0	26.99	.02	63.3	2.2
Apr. 10.5	64.45	0.31	91.1	3.5	15.98	.01	46.4	0.2	33.80	.08	48.6	3.0	10.24	.00	39.5	0.7	27.01	.03	65.5	2.2
20.4	64.14	0.46	94.6	3.2	15.97	.03	46.2	0.3	33.72	.13	51.6	2.8	10.24	.03	40.2	0.6	26.98	.06	67.7	2.1
30.4	63.68	0.59	97.8	2.9	15.94	.05	45.9	0.4	33.59	.18	54.4	2.4	10.21	.04	40.8	0.3	26.92	.10	69.8	2.0
May 10.4	63.09	0.70	100.7	2.5	15.89	.07	45.5	0.5	33.41	.23	56.8	2.1	10.17	.07	41.1	0.2	26.82	.12	71.8	1.8
20.4	62.39	0.81	103.2	2.0	15.82	.08	45.0	0.6	33.18	.27	58.9	1.6	10.10	.08	41.3	0.0	26.70	.14	73.6	1.5
30.3	61.58	0.88	105.2	1.6	15.74	.09	44.4	0.6	32.91	.30	60.5	1.2	10.02	.09	41.3	0.3	26.56	.16	75.1	1.2
June 9.3	60.70	0.94	106.8	1.0	15.65	.10	43.8	0.6	32.61	.33	61.7	0.7	9.93	.10	41.0	0.3	26.40	.16	76.3	0.8
19.3	59.76	0.98	107.8	0.5	15.55	.09	43.2	0.6	32.28	.34	62.4	0.3	9.83	.10	40.7	0.5	26.24	.17	77.1	0.4
29.2	58.78	0.99	108.3	0.1	15.46	.10	42.6	0.6	31.94	.35	62.7	0.3	9.73	.11	40.2	0.7	26.07	.17	77.5	0.1
July 9.2	57.79	0.97	108.2	0.6	15.36	.09	42.0	0.6	31.59	.35	62.4	0.8	9.62	.11	39.5	0.7	25.90	.16	77.6	0.3
19.2	56.82	0.92	107.6	1.2	15.27	.09	41.4	0.5	31.24	.34	61.6	1.2	9.51	.10	38.8	0.9	25.74	.15	77.3	0.8
29.2	55.90	0.84	106.4	1.7	15.18	.08	40.9	0.4	30.90	.31	60.4	1.6	9.41	.10	37.9	0.9	25.59	.14	76.5	1.1
Aug. 8.1	55.06	0.73	104.7	2.1	15.10	.06	40.5	0.3	30.59	.27	58.8	2.0	9.31	.08	37.0	0.9	25.45	.12	75.4	1.5
18.1	54.33	0.60	102.6	2.4	15.04	.05	40.2	0.2	30.32	.22	56.8	2.3	9.23	.06	36.1	0.9	25.33	.09	73.9	1.8
28.1	53.73	0.43	100.2	2.8	14.99	.02	40.0	0.1	30.10	.15	54.5	2.5	9.17	.04	35.2	0.9	25.24	.06	72.1	2.1
Sept. 7.1	53.30	0.25	97.4	2.9	14.97	.01	39.9	0.2	29.95	.08	52.0	2.7	9.13	.01	34.3	0.7	25.18	.02	70.0	2.4
17.0	53.05	0.04	94.5	3.0	14.98	.04	40.1	0.3	29.87	.00	49.3	2.7	9.12	.03	33.6	0.6	25.16	.01	67.6	2.7
27.0	53.01	0.16	91.5	3.0	15.02	.08	40.4	0.7	29.87	.09	46.6	2.6	9.15	.07	33.0	0.3	25.17	.07	64.9	2.9
Oct. 7.0	53.17	0.38	88.5	2.8	15.10	.12	41.1	0.8	29.96	.18	44.0	2.4	9.22	.12	32.7	0.1	25.24	.11	62.0	3.0
16.9	53.55	0.58	85.7	2.5	15.22	.16	41.9	1.2	30.14	.27	41.6	2.1	9.34	.16	32.6	0.2	25.35	.16	59.0	3.2
26.9	54.13	0.77	83.2	2.2	15.38	.21	43.1	1.4	30.41	.36	39.5	1.7	9.50	.20	32.8	0.5	25.51	.22	55.8	3.2
Nov. 5.9	54.90	0.94	81.0	1.6	15.59	.24	44.5	1.6	30.77	.43	37.8	1.2	9.70	.25	33.3	0.9	25.73	.27	52.6	3.1
15.9	55.84	1.08	79.4	1.1	15.83	.28	46.1	1.9	31.20	.50	36.6	0.7	9.95	.28	34.2	1.2	26.00	.32	49.5	3.1
25.8	56.92	1.17	78.3	0.5	16.11	.31	48.0	2.0	31.70	.55	35.9	0.1	10.23	.31	35.4	1.6	26.32	.36	46.4	2.8
Dec. 5.8	58.09	1.23	77.8	0.2	16.42	.33	50.0	2.2	32.25	.59	35.8	0.6	10.54	.34	37.0	1.8	26.68	.39	43.6	2.5
15.8	59.32	1.24	78.0	0.8	16.75	.34	52.2	2.2	32.84	.59	36.4	1.1	10.88	.35	38.8	2.0	27.07	.41	41.1	2.2
25.8	60.56	1.22	78.8	1.4	17.09	.33	54.4	2.2	33.43	.59	37.5	1.6	11.23	.34	40.8	2.2	27.48	.41	38.9	1.7
35.7	61.78		80.2		17.42		56.6		34.02		39.1		11.57		43.0		27.89		37.2	

(CONSTANTS OF STRUVE AND PETERS.)

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	β Corvi.				κ Draconis.				γ Virginis (mean).				31 Comæ Berenices.				32² Camelop. (H.)			
	Right Ascension.		Declination South.		Right Ascension.		Declination North.		Right Ascension.		Declination South.		Right Ascension.		Declination North.		Right Ascension.		Declination North.	
	h m 12 29		° ′ −22 53		h m 12 29		° ′ +70 16		h m 12 37		° ′ − 0 56		h m 12 47		° ′ +28 1		h m 12 48		° ′ +83 53	
	s		″		s		″		s		″		s		″		s		″	
Jan. 0.7	35.25	.35	23.8	2.2	35.66	.78	70.0	0.7	1.96	.33	56.1	2.1	15.00	.36	64.2	1.9	26.44	2.23	73.1	0.6
10.7	35.60	.32	26.0	2.4	36.44	.75	69.3	0.0	2.29	.32	58.2	2.0	15.36	.35	62.3	1.4	28.67	2.20	72.5	0.1
20.7	35.92	.31	28.4	2.4	37.19	.71	69.3	0.6	2.61	.29	60.2	1.9	15.71	.33	60.9	1.0	30.87	2.10	72.6	0.7
30.7	36.23	.26	30.8	2.4	37.90	.64	69.9	1.2	2.90	.26	62.1	1.6	16.04	.30	59.9	0.5	32.97	1.94	73.3	1.3
Feb. 9.6	36.49	.23	33.2	2.3	38.54	.55	71.1	1.8	3.16	.23	63.7	1.4	16.34	.27	59.4	0.0	34.91	1.69	74.6	1.9
19.6	36.72	.19	35.5	2.2	39.09	.44	72.9	2.2	3.39	.19	65.1	1.1	16.61	.22	59.4	0.4	36.60	1.40	76.5	2.3
Mar. 1.6	36.91	.15	37.7	2.1	39.53	.33	75.1	2.6	3.58	.15	66.2	0.8	16.83	.18	59.8	0.7	38.00	1.05	78.8	2.8
11.6	37.06	.11	39.8	1.8	39.86	.21	77.7	2.8	3.73	.11	67.0	0.5	17.01	.13	60.5	1.1	39.05	0.68	81.6	2.9
21.5	37.17	.07	41.6	1.6	40.07	.08	80.5	3.0	3.84	.08	67.5	0.3	17.14	.09	61.6	1.4	39.73	0.29	84.5	3.1
31.5	37.24	.03	43.2	1.4	40.15	.03	83.5	2.9	3.92	.04	67.8	0.1	17.23	.04	63.0	1.6	40.02	0.09	87.6	3.1
Apr. 10.5	37.27	.00	44.6	1.2	40.12	.15	86.4	2.9	3.96	.01	67.9	0.1	17.27	.01	64.6	1.7	39.93	0.46	90.7	3.0
20.4	37.27	.02	45.8	0.9	39.97	.24	89.3	2.6	3.97	.01	67.8	0.2	17.28	.02	66.3	1.7	39.47	0.79	93.7	2.7
30.4	37.25	.05	46.7	0.7	39.73	.32	91.9	2.4	3.96	.04	67.6	0.4	17.26	.05	68.0	1.6	38.68	1.10	96.4	2.4
May 10.4	37.20	.07	47.4	0.5	39.41	.39	94.3	1.9	3.92	.06	67.2	0.5	17.21	.07	69.6	1.6	37.58	1.35	98.8	2.0
20.4	37.13	.08	47.9	0.2	39.02	.44	96.2	1.5	3.86	.07	66.7	0.6	17.14	.09	71.2	1.4	36.23	1.56	100.8	1.6
30.3	37.05	.09	48.1	0.0	38.58	.48	97.7	1.0	3.79	.08	66.1	0.6	17.05	.11	72.6	1.2	34.67	1.71	102.4	1.0
June 9.3	36.96	.11	48.1	0.2	38.10	.49	98.7	0.5	3.71	.09	65.5	0.6	16.94	.12	73.8	0.9	32.96	1.81	103.4	0.5
19.3	36.85	.11	47.9	0.4	37.61	.51	99.2	0.0	3.62	.09	64.9	0.6	16.82	.12	74.7	0.7	31.15	1.86	103.9	0.1
29.3	36.74	.12	47.5	0.6	37.10	.49	99.2	0.6	3.53	.10	64.3	0.6	16.70	.12	75.4	0.4	29.29	1.85	103.8	0.7
July 9.2	36.62	.12	46.9	0.8	36.61	.47	98.6	1.1	3.43	.10	63.7	0.5	16.58	.13	75.8	0.1	27.44	1.80	103.1	1.2
19.2	36.50	.12	46.1	0.9	36.14	.44	97.5	1.6	3.33	.10	63.2	0.5	16.45	.13	75.9	0.2	25.64	1.70	101.9	1.7
29.2	36.38	.10	45.2	1.1	35.70	.40	95.9	2.1	3.23	.09	62.7	0.5	16.32	.11	75.7	0.5	23.94	1.57	100.2	2.2
Aug. 8.1	36.28	.09	44.1	1.2	35.30	.34	93.8	2.5	3.14	.08	62.2	0.3	16.21	.10	75.2	0.8	22.37	1.41	98.0	2.6
18.1	36.19	.08	42.9	1.2	34.96	.28	91.3	2.8	3.06	.07	61.9	0.2	16.11	.09	74.4	1.1	20.96	1.20	95.4	3.0
28.1	36.11	.04	41.7	1.1	34.68	.21	88.5	3.2	2.99	.04	61.7	0.1	16.02	.06	73.3	1.4	19.76	0.96	92.4	3.3
Sept. 7.1	36.07	.02	40.6	1.1	34.47	.12	85.3	3.4	2.95	.01	61.6	0.1	15.96	.03	71.9	1.8	18.80	0.71	89.1	3.6
17.0	36.05	.03	39.5	1.0	34.35	.03	81.9	3.6	2.94	.02	61.7	0.3	15.93	.00	70.1	2.0	18.09	0.43	85.5	3.8
27.0	36.08	.06	38.5	0.8	34.32	.07	78.3	3.8	2.96	.05	62.0	0.6	15.93	.05	68.1	2.2	17.66	0.13	81.7	3.9
Oct. 7.0	36.14	.11	37.7	0.5	34.39	.16	74.5	3.8	3.01	.10	62.6	0.8	15.98	.09	65.9	2.4	17.53	0.18	77.8	3.9
17.0	36.25	.16	37.2	0.2	34.55	.27	70.7	3.8	3.11	.14	63.4	1.1	16.07	.13	63.5	2.7	17.71	0.51	73.9	3.9
26.9	36.41	.21	37.0	0.2	34.82	.38	66.9	3.7	3.25	.19	64.5	1.3	16.20	.18	60.8	2.7	18.22	0.83	70.0	3.7
Nov. 5.9	36.62	.25	37.2	0.5	35.20	.48	63.2	3.4	3.44	.23	65.8	1.6	16.38	.23	58.1	2.8	19.05	1.14	66.3	3.5
15.9	36.87	.29	37.7	0.9	35.68	.57	59.8	3.2	3.67	.26	67.4	1.8	16.61	.27	55.3	2.9	20.19	1.44	62.8	3.1
25.8	37.16	.32	38.6	1.3	36.25	.65	56.6	2.7	3.93	.30	69.2	2.0	16.88	.31	52.4	2.8	21.63	1.70	59.7	2.8
Dec. 5.8	37.48	.35	39.9	1.6	36.90	.72	53.9	2.3	4.23	.32	71.2	2.2	17.19	.34	49.6	2.6	23.33	1.92	56.9	2.2
15.8	37.83	.36	41.5	1.9	37.62	.76	51.6	1.7	4.55	.33	73.4	2.2	17.53	.36	47.0	2.3	25.25	2.09	54.7	1.7
25.8	38.19	.35	43.4	2.2	38.38	.78	49.9	1.1	4.88	.34	75.6	2.2	17.89	.37	44.7	2.1	27.34	2.19	53.0	1.0
35.7	38.54		45.6		39.16		48.8		5.22		77.8		18.26		42.6		29.53		52.0	

(CONSTANTS OF STRUVE AND PETERS.)

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Canum Venat.				δ Muscæ.				ε Virginis.				θ Virginis.				20 Canum Venat.			
	Right Ascension.		Declination North.		Right Ascension.		Declination South.		Right Ascension.		Declination North.		Right Ascension.		Declination South.		Right Ascension.		Declination North.	
	h m 12 51		° ′ +38 48		h m 12 55		° ′ −71 3		h m 12 57		° ′ +11 26		h m 13 5		° ′ − 5 3		h m 13 13		° ′ +41 2	
	s		″		s		″		s		″		s		″		s		″	
Jan. 0.8	45.35	.39	27.3	1.7	57.98	.80	4.3	1.3	37.71	.34	54.0	2.1	13.02	.34	5.5	2.1	26.73	.40	57.5	1.9
10.7	45.74	.39	25.6	1.2	58.78	.76	5.6	1.9	38.05	.33	51.9	1.8	13.36	.32	7.6	2.1	27.13	.40	55.6	1.3
20.7	46.13	.37	24.4	0.6	59.54	.72	7.5	2.4	38.38	.31	50.1	1.6	13.68	.31	9.7	1.9	27.53	.38	54.3	0.8
30.7	46.50	.33	23.8	0.1	60.26	.65	9.9	2.8	38.69	.28	48.5	1.2	13.99	.28	11.6	1.8	27.91	.36	53.5	0.2
Feb. 9.7	46.83	.29	23.7	0.4	60.91	.57	12.7	3.1	38.97	.25	47.3	0.8	14.27	.25	13.4	1.6	28.27	.32	53.3	0.3
19.6	47.12	.25	24.1	0.9	61.48	.47	15.8	3.4	39.22	.21	46.5	0.5	14.52	.21	15.0	1.3	28.59	.27	53.6	0.8
Mar. 1.6	47.37	.20	25.0	1.3	61.95	.37	19.2	3.5	39.43	.17	46.0	0.2	14.73	.18	16.3	1.0	28.86	.23	54.4	1.3
11.6	47.57	.15	26.3	1.6	62.32	.28	22.7	3.6	39.60	.14	45.8	0.2	14.91	.14	17.3	0.8	29.09	.18	55.7	1.7
21.5	47.72	.09	27.9	1.9	62.60	.18	26.3	3.6	39.74	.09	46.0	0.4	15.05	.10	18.1	0.6	29.27	.12	57.4	2.0
31.5	47.81	.05	29.8	2.1	62.78	.08	29.9	3.6	39.83	.06	46.4	0.7	15.15	.07	18.7	0.3	29.39	.07	59.4	2.1
Apr. 10.5	47.86	.01	31.9	2.1	62.86	.01	33.5	3.4	39.89	.03	47.1	0.9	15.22	.04	19.0	0.1	29.46	.03	61.5	2.3
20.5	47.87	.04	34.0	2.2	62.85	.11	36.9	3.2	39.92	.00	48.0	0.9	15.26	.02	19.1	0.0	29.49	.01	63.8	2.3
30.4	47.83	.06	36.2	2.0	62.74	.19	40.1	3.0	39.92	.02	48.9	1.0	15.28	.01	19.1	0.2	29.48	.05	66.1	2.2
May 10.4	47.77	.10	38.2	1.9	62.55	.27	43.1	2.6	39.90	.05	49.9	1.1	15.27	.04	18.9	0.4	29.43	.08	68.3	2.1
20.4	47.67	.12	40.1	1.6	62.28	.35	45.7	2.2	39.85	.06	51.0	1.0	15.23	.05	18.5	0.4	29.35	.11	70.4	1.8
30.4	47.55	.13	41.7	1.3	61.93	.40	47.9	1.8	39.79	.08	52.0	0.9	15.18	.06	18.1	0.4	29.24	.14	72.2	1.5
June 9.3	47.42	.15	43.0	1.0	61.53	.46	49.7	1.4	39.71	.09	52.9	0.8	15.12	.08	17.7	0.6	29.10	.15	73.7	1.3
19.3	47.27	.15	44.0	0.7	61.07	.50	51.1	0.9	39.62	.10	53.7	0.8	15.04	.10	17.1	0.5	28.95	.16	75.0	0.8
29.3	47.12	.16	44.7	0.3	60.57	.53	52.0	0.3	39.52	.10	54.5	0.5	14.94	.10	16.6	0.6	28.79	.17	75.8	0.5
July 9.2	46.96	.16	45.0	0.1	60.04	.54	52.3	0.2	39.42	.11	55.0	0.5	14.84	.10	16.0	0.6	28.62	.17	76.3	0.0
19.2	46.80	.16	44.9	0.5	59.50	.54	52.1	0.7	39.31	.11	55.5	0.2	14.74	.11	15.4	0.5	28.45	.18	76.3	0.3
29.2	46.64	.14	44.4	0.8	58.96	.51	51.4	1.2	39.20	.10	55.7	0.1	14.63	.10	14.9	0.5	28.27	.17	76.0	0.8
Aug. 8.2	46.50	.13	43.6	1.2	58.45	.47	50.2	1.7	39.10	.09	55.8	0.2	14.53	.10	14.4	0.5	28.10	.15	75.2	1.2
18.1	46.37	.11	42.4	1.6	57.98	.41	48.5	2.1	39.01	.08	55.6	0.3	14.43	.09	13.9	0.4	27.95	.14	74.0	1.5
28.1	46.26	.08	40.8	1.9	57.57	.33	46.4	2.4	38.93	.06	55.3	0.6	14.34	.06	13.5	0.2	27.81	.11	72.5	1.9
Sept. 7.1	46.18	.05	38.9	2.3	57.24	.23	44.0	2.6	38.87	.04	54.7	0.8	14.28	.04	13.3	0.1	27.70	.08	70.6	2.3
17.1	46.13	.01	36.6	2.5	57.01	.12	41.4	2.8	38.83	.00	53.9	1.0	14.24	.01	13.2	0.1	27.62	.04	68.3	2.5
27.0	46.12	.03	34.1	2.7	56.89	.01	38.6	2.8	38.83	.03	52.9	1.3	14.23	.03	13.3	0.3	27.58	.00	65.8	2.8
Oct. 7.0	46.15	.08	31.4	2.9	56.90	.14	35.8	2.7	38.86	.08	51.6	1.6	14.26	.07	13.6	0.5	27.58	.05	63.0	3.0
17.0	46.23	.14	28.5	3.1	57.04	.27	33.1	2.6	38.94	.12	50.0	1.8	14.33	.12	14.1	0.9	27.63	.10	60.0	3.2
26.9	46.37	.18	25.4	3.2	57.31	.39	30.5	2.2	39.06	.17	48.2	2.0	14.45	.16	15.0	1.0	27.73	.16	56.8	3.3
Nov. 5.9	46.55	.24	22.2	3.2	57.70	.52	28.3	1.9	39.23	.21	46.2	2.1	14.61	.21	16.0	1.4	27.89	.22	53.5	3.3
15.9	46.79	.29	19.0	3.1	58.22	.62	26.4	1.3	39.44	.25	44.1	2.3	14.82	.25	17.4	1.6	28.11	.26	50.2	3.3
25.9	47.08	.33	15.9	2.9	58.84	.70	25.1	0.8	39.69	.29	41.8	2.4	15.07	.28	19.0	1.8	28.37	.32	46.9	3.1
Dec. 5.8	47.41	.36	13.0	2.7	59.54	.77	24.3	0.2	39.98	.31	39.4	2.4	15.35	.31	20.8	2.0	28.69	.35	43.8	2.9
15.8	47.77	.39	10.3	2.4	60.31	.80	24.1	0.4	40.29	.33	37.0	2.4	15.66	.33	22.8	2.1	29.04	.39	40.9	2.6
25.8	48.16	.39	7.9	2.0	61.11	.80	24.5	1.0	40.62	.34	34.6	2.2	15.99	.34	24.9	2.1	29.43	.40	38.3	2.1
35.8	48.55		5.9		61.91		25.5		40.96		32.4		16.33		27.0		29.83		36.2	

FIXED STARS, 1909.

(CONSTANTS OF STRUVE AND PETERS.)

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Virginis. (*Spica.*)				κ Octantis.				ζ Virginis.				B. A. C. 4536.				[illegible] Virginis.			
	Right Ascension.		Declination *South.*		Right Ascension.		Declination *South.*		Right Ascension.		Declination *South.*		Right Ascension.		Declination *North.*		Right Ascension.		Declination *South.*	
	h m 13 20		° ′ −10 41		h m 13 25		° ′ −85 18		h m 13 30		° ′ − 0 7		h m 13 30		° ′ +37 38		h m 13 36		° ′ − 8 14	
	s		″		s		″		s		″		s		″		s		″	
Jan. 0.8	22.53		3.0		55.54		47.2		1.98		46.4		42.86		47.2		48.65		31.4	
		.34		2.1		2.90		0.6		.33		2.2		.38		2.1		.33		2.0
10.8	22.87		5.1		58.44		47.8		2.31		48.6		43.24		45.1		48.98		33.4	
		.33		2.1		2.87		1.2		.33		2.0		.39		1.6		.33		2.0
20.7	23.20		7.2		61.31		49.0		2.64		50.6		43.63		43.5		49.31		35.4	
		.32		2.0		2.74		1.7		.31		1.8		.37		1.0		.32		2.0
30.7	23.52		9.2		64.05		50.7		2.95		52.4		44.00		42.5		49.63		37.4	
		.29		1.9		2.56		2.3		.29		1.6		.35		0.5		.30		1.8
Feb. 9.7	23.81		11.1		66.61		53.0		3.24		54.0		44.35		42.0		49.93		39.2	
		.26		1.7		2.32		2.7		.27		1.4		.32		0.1		.27		1.6
19.6	24.07		12.8		68.93		55.7		3.51		55.4		44.67		42.1		50.20		40.8	
		.23		1.6		2.01		3.1		.23		1.1		.28		0.6		.24		1.4
Mar. 1.6	24.30		14.4		70.94		58.8		3.74		56.5		44.95		42.7		50.44		42.2	
		.19		1.3		1.68		3.4		.20		0.8		.24		1.0		.21		1.2
11.6	24.49		15.7		72.62		62.2		3.94		57.3		45.19		43.7		50.65		43.4	
		.16		1.1		1.32		3.6		.16		0.5		.19		1.5		.17		1.0
21.6	24.65		16.8		73.94		65.8		4.10		57.8		45.38		45.2		50.82		44.4	
		.12		0.9		0.94		3.7		.13		0.2		.14		1.8		.14		0.7
31.5	24.77		17.7		74.88		69.5		4.23		58.0		45.52		47.0		50.96		45.1	
		.09		0.7		0.54		3.8		.10		0.0		.10		2.0		.10		0.5
Apr. 10.5	24.86		18.4		75.42		73.3		4.33		58.0		45.62		49.0		51.06		45.6	
		.05		0.4		0.14		3.7		.06		0.2		.05		2.2		.07		0.2
20.5	24.91		18.8		75.56		77.0		4.39		57.8		45.67		51.2		51.13		45.8	
		.03		0.3		0.25		3.7		.03		0.3		.01		2.2		.04		0.1
30.5	24.94		19.1		75.31		80.7		4.42		57.5		45.68		53.4		51.17		45.9	
		.00		0.1		0.64		3.5		.01		0.5		.03		2.2		.02		0.0
May 10.4	24.94		19.2		74.67		84.2		4.43		57.0		45.65		55.6		51.19		45.9	
		.02		0.1		1.01		3.2		.01		0.6		.05		2.0		.00		0.2
20.4	24.92		19.1		73.66		87.4		4.42		56.4		45.60		57.6		51.19		45.7	
		.04		0.2		1.35		2.9		.04		0.6		.09		1.9		.03		0.3
30.4	24.88		18.9		72.31		90.3		4.38		55.8		45.51		59.5		51.16		45.4	
		.06		0.2		1.67		2.5		.05		0.7		.11		1.6		.05		0.3
June 9.3	24.82		18.7		70.64		92.8		4.33		55.1		45.40		61.1		51.11		45.1	
		.07		0.4		1.95		2.1		.07		0.7		.13		1.4		.07		0.4
19.3	24.75		18.3		68.69		94.9		4.26		54.4		45.27		62.5		51.04		44.7	
		.09		0.4		2.16		1.6		.09		0.6		.14		1.0		.08		0.5
29.3	24.66		17.9		66.53		96.5		4.17		53.8		45.13		63.5		50.96		44.2	
		.10		0.5		2.33		1.0		.09		0.6		.16		0.6		.09		0.5
July 9.3	24.56		17.4		64.20		97.5		4.08		53.2		44.97		64.1		50.87		43.7	
		.11		0.6		2.43		0.5		.11		0.5		.17		0.3		.11		0.5
19.2	24.45		16.8		61.77		98.0		3.97		52.7		44.80		64.4		50.76		43.2	
		.11		0.6		2.46		0.1		.11		0.5		.17		0.1		.12		0.6
29.2	24.34		16.2		59.31		97.9		3.86		52.2		44.63		64.3		50.64		42.6	
		.12		0.6		2.40		0.6		.12		0.4		.16		0.6		.12		0.5
Aug. 8.2	24.22		15.6		56.91		97.3		3.74		51.8		44.47		63.7		50.52		42.1	
		.11		0.6		2.27		1.2		.11		0.3		.16		0.9		.11		0.5
18.2	24.11		15.0		54.64		96.1		3.63		51.5		44.31		62.8		50.41		41.6	
		.09		0.6		2.05		1.7		.10		0.2		.14		1.3		.11		0.4
28.1	24.02		14.4		52.59		94.4		3.53		51.3		44.17		61.5		50.30		41.2	
		.08		0.4		1.76		2.2		.08		0.0		.12		1.7		.09		0.4
Sept. 7.1	23.94		14.0		50.83		92.2		3.45		51.3		44.05		59.8		50.21		40.8	
		.06		0.4		1.39		2.5		.06		0.2		.10		2.0		.06		0.2
17.1	23.88		13.6		49.44		89.7		3.39		51.5		43.95		57.8		50.15		40.6	
		.02		0.2		0.97		2.8		.03		0.4		.06		2.3		.04		0.1
27.0	23.86		13.4		48.47		86.9		3.36		51.9		43.89		55.5		50.11		40.5	
		.01		0.1		0.49		3.0		.00		0.6		.02		2.6		.00		0.1
Oct. 7.0	23.87		13.3		47.98		83.9		3.36		52.5		43.87		52.9		50.11		40.6	
		.06		0.2		0.01		3.1		.04		0.8		.03		2.9		.04		0.3
17.0	23.93		13.5		47.99		80.8		3.40		53.3		43.90		50.0		50.15		40.9	
		.11		0.5		0.53		3.0		.09		1.1		.08		3.0		.08		0.6
27.0	24.04		14.0		48.52		77.8		3.49		54.4		43.98		47.0		50.23		41.5	
		.15		0.7		1.04		2.8		.14		1.3		.14		3.2		.14		0.8
Nov. 5.9	24.19		14.7		49.56		75.0		3.63		55.7		44.12		43.8		50.37		42.3	
		.19		1.0		1.52		2.4		.18		1.6		.19		3.3		.18		1.1
15.9	24.38		15.7		51.08		72.6		3.81		57.3		44.31		40.5		50.55		43.4	
		.24		1.3		1.95		2.1		.23		1.8		.24		3.3		.22		1.4
25.9	24.62		17.0		53.03		70.5		4.04		59.1		44.55		37.2		50.77		44.8	
		.28		1.5		2.31		1.6		.27		1.9		.29		3.1		.27		1.6
Dec. 5.9	24.90		18.5		55.34		68.9		4.31		61.0		44.84		34.1		51.04		46.4	
		.31		1.8		2.60		1.0		.29		2.1		.33		3.0		.30		1.8
15.8	25.21		20.3		57.94		67.9		4.60		63.1		45.17		31.1		51.34		48.2	
		.33		1.9		2.80		0.4		.32		2.2		.36		2.7		.32		1.9
25.8	25.54		22.2		60.74		67.5		4.92		65.3		45.53		28.4		51.66		50.1	
		.34		2.1		2.90		0.2		.33		2.1		.38		2.3		.33		2.1
35.8	25.88		24.3		63.64		67.7		5.25		67.4		45.91		26.1		51.99		52.2	

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	η Ursæ Majoris.				η Bootis.				θ Apodis.				β Centauri.				π Hydræ.			
	Right Ascension.		Declination *North.*		Right Ascension.		Declination *North.*		Right Ascension.		Declination *South.*		Right Ascension.		Declination *South*		Right Ascension.		Declination *South.*	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	13 43		+49 45		13 50		+18 50		13 56		−76 21		13 57		−59 55		14 1		−26 14	
	s		″		s		″		s		″		s		″		s		″	
Jan. 0.8	56.04	.44	51.8	2.1	19.73	.34	71.0	2.3	21.92	1.09	4.7	0.3	21.26	.57	42.1	0.8	9.50	.36	27.0	1.6
10.8	56.48	.44	49.7	1.4	20.07	.34	68.7	1.9	23.01	1.09	5.0	0.9	21.83	.57	42.9	1.3	9.86	.36	28.6	1.8
20.8	56.92	.44	48.3	0.9	20.41	.33	66.8	1.6	24.10	1.06	5.9	1.5	22.40	.55	44.2	1.7	10.22	.35	30.4	1.9
30.7	57.36	.42	47.4	0.3	20.74	.31	65.2	1.2	25.16	1.02	7.4	2.0	22.95	.52	45.9	2.1	10.57	.33	32.3	2.0
Feb. 9.7	57.78	.38	47.1	0.4	21.05	.29	64.0	0.7	26.18	0.94	9.4	2.4	23.47	.48	48.0	2.4	10.90	.31	34.3	2.0
19.7	58.16	.34	47.5	0.9	21.34	.26	63.3	0.3	27.12	0.85	11.8	2.8	23.95	.44	50.4	2.7	11.21	.27	36.3	2.0
Mar. 1.6	58.50	.29	48.4	1.4	21.60	.22	63.0	0.1	27.97	0.74	14.6	3.1	24.39	.39	53.1	2.9	11.48	.25	38.3	1.9
11.6	58.79	.23	49.8	1.9	21.82	.18	63.1	0.4	28.71	0.62	17.7	3.3	24.78	.32	56.0	3.0	11.73	.21	40.2	1.8
21.6	59.02	.18	51.7	2.3	22.00	.15	63.5	0.8	29.33	0.50	21.0	3.5	25.10	.27	59.0	3.1	11.94	.17	42.0	1.6
31.6	59.20	.12	54.0	2.4	22.15	.12	64.3	1.1	29.83	0.37	24.5	3.5	25.37	.20	62.1	3.1	12.11	.14	43.6	1.5
Apr. 10.5	59.32	.06	56.4	2.6	22.27	.08	65.4	1.3	30.20	0.23	28.0	3.5	25.57	.15	65.2	3.0	12.25	.11	45.1	1.3
20.5	59.38	.01	59.0	2.7	22.35	.05	66.7	1.4	30.43	0.10	31.5	3.5	25.72	.08	68.2	2.9	12.36	.07	46.4	1.2
30.5	59.39	.04	61.7	2.6	22.40	.01	68.1	1.5	30.53	0.03	35.0	3.3	25.80	.03	71.1	2.7	12.43	.05	47.6	1.0
May 10.5	59.35	.08	64.3	2.4	22.41	.01	69.6	1.5	30.50	0.16	38.3	3.1	25.83	.03	73.8	2.5	12.48	.02	48.6	0.8
20.4	59.27	.12	66.7	2.2	22.40	.03	71.1	1.5	30.34	0.29	41.4	2.9	25.80	.08	76.3	2.2	12.50	.01	49.4	0.7
30.4	59.15	.16	68.9	1.9	22.37	.06	72.6	1.3	30.05	0.41	44.3	2.5	25.72	.14	78.5	1.9	12.49	.04	50.1	0.4
June 9.4	58.99	.18	70.8	1.5	22.31	.08	73.9	1.2	29.64	0.51	46.8	2.1	25.58	.19	80.4	1.6	12.45	.07	50.5	0.3
19.3	58.81	.20	72.3	1.1	22.23	.09	75.1	1.0	29.13	0.61	48.9	1.7	25.39	.23	82.0	1.2	12.38	.08	50.8	0.1
29.3	58.61	.22	73.4	0.7	22.14	.11	76.1	0.8	28.52	0.69	50.6	1.2	25.16	.27	83.2	0.8	12.30	.11	50.9	0.1
July 9.3	58.39	.23	74.1	0.2	22.03	.12	76.9	0.5	27.83	0.74	51.8	0.7	24.89	.30	84.0	0.4	12.19	.12	50.8	0.3
19.3	58.16	.23	74.3	0.3	21.91	.13	77.4	0.3	27.09	0.78	52.5	0.2	24.59	.31	84.4	0.1	12.07	.14	50.5	0.4
29.2	57.93	.24	74.0	0.7	21.78	.13	77.7	0.1	26.31	0.78	52.7	0.4	24.28	.32	84.3	0.6	11.93	.14	50.1	0.6
Aug. 8.2	57.69	.22	73.3	1.2	21.65	.13	77.8	0.3	25.53	0.77	52.3	0.9	23.96	.32	83.7	1.0	11.79	.15	49.5	0.7
18.2	57.47	.21	72.1	1.6	21.52	.13	77.5	0.5	24.76	0.72	51.4	1.4	23.64	.30	82.7	1.4	11.64	.14	48.8	0.9
28.2	57.26	.18	70.5	2.0	21.39	.10	77.0	0.8	24.04	0.64	50.0	1.9	23.34	.27	81.3	1.7	11.50	.12	47.9	0.9
Sept. 7.1	57.08	.15	68.5	2.4	21.29	.09	76.2	1.1	23.40	0.53	48.1	2.2	23.07	.22	79.6	2.0	11.38	.10	47.0	1.0
17.1	56.93	.11	66.1	2.7	21.20	.06	75.1	1.3	22.87	0.39	45.9	2.6	22.85	.16	77.6	2.3	11.28	.07	46.0	1.0
27.1	56.82	.06	63.4	3.1	21.14	.02	73.8	1.7	22.48	0.24	43.3	2.7	22.69	.08	75.3	2.3	11.21	.03	45.0	0.9
Oct. 7.0	56.76	.01	60.3	3.3	21.12	.02	72.1	1.9	22.24	0.07	40.6	2.9	22.61	.00	73.0	2.4	11.18	.02	44.1	0.7
17.0	56.75	.06	57.0	3.5	21.14	.06	70.2	2.2	22.17	0.11	37.7	2.8	22.61	.08	70.6	2.3	11.20	.07	43.4	0.6
27.0	56.81	.12	53.5	3.6	21.20	.11	68.0	2.3	22.28	0.30	34.9	2.7	22.69	.18	68.3	2.1	11.27	.12	42.8	0.3
Nov. 6.0	56.93	.18	49.9	3.6	21.31	.16	65.7	2.5	22.58	0.48	32.2	2.5	22.87	.27	66.2	1.8	11.39	.18	42.5	0.0
15.9	57.11	.25	46.3	3.6	21.47	.21	63.2	2.7	23.06	0.65	29.7	2.1	23.14	.36	64.4	1.4	11.57	.22	42.5	0.3
25.9	57.36	.31	42.7	3.4	21.68	.25	60.5	2.8	23.71	0.80	27.6	1.6	23.50	.42	63.0	1.0	11.79	.27	42.8	0.6
Dec. 5.9	57.67	.36	39.3	3.1	21.93	.29	57.7	2.7	24.51	0.92	26.0	1.1	23.92	.49	62.0	0.6	12.06	.31	43.4	0.9
15.8	58.03	.40	36.2	2.8	22.22	.31	55.0	2.6	25.43	1.02	24.9	0.6	24.41	.54	61.4	0.0	12.37	.34	44.3	1.2
25.8	58.43	.43	33.4	2.4	22.53	.33	52.4	2.4	26.45	1.07	24.3	0.0	24.95	.56	61.4	0.5	12.71	.35	45.5	1.5
35.8	58.86		31.0		22.86		50.0		27.52		24.3		25.51		61.9		13.06		47.0	

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	*α* Draconis.				*d* Bootis.				*κ* Virginis.				4 Ursæ Minoris.				*α* Bootis. (*Arcturus.*)			
	Right Ascension.		Declination *North.*		Right Ascension.		Declination *North.*		Right Ascension.		Declination *South.*		Right Ascension.		Declination *North.*		Right Ascension.		Declination *North.*	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	14 1		+64 48		14 6		+25 30		14 8		− 9 50		14 9		+77 57		14 11		+19 38	
	s		″		s		″		s		″		s		″		s		″	
Jan. 0.8	53.92	.59	25.7	2.0	13.51	.34	76.5	2.3	0.80	.33	54.6	1.9	9.00	1.07	76.9	1.9	29.12	.33	78.7	2.4
10.8	54.51	.62	23.7	1.4	13.85	.35	74.2	2.0	1.13	.33	56.5	1.9	10.07	1.13	75.0	1.2	29.45	.34	76.3	2.1
20.8	55.13	.61	22.3	0.7	14.20	.34	72.2	1.6	1.46	.33	58.4	1.9	11.20	1.15	73.8	0.5	29.79	.33	74.2	1.7
30.7	55.74	.60	21.6	0.1	14.54	.33	70.6	1.1	1.79	.31	60.3	1.8	12.35	1.13	73.3	0.1	30.12	.32	72.5	1.3
Feb. 9.7	56.34	.55	21.5	0.6	14.87	.31	69.5	0.6	2.10	.29	62.1	1.6	13.48	1.07	73.4	0.7	30.44	.29	71.2	0.8
19.7	56.89	.50	22.1	1.2	15.18	.28	68.9	0.1	2.39	.26	63.7	1.4	14.55	0.97	74.1	1.4	30.73	.27	70.4	0.4
Mar. 1.7	57.39	.44	23.3	1.7	15.46	.24	68.8	0.3	2.65	.23	65.1	1.2	15.52	0.84	75.5	2.0	31.00	.24	70.0	0.0
11.6	57.83	.35	25.0	2.2	15.70	.20	69.1	0.8	2.88	.20	66.3	0.9	16.36	0.69	77.5	2.4	31.24	.20	70.0	0.4
21.6	58.18	.27	27.2	2.6	15.90	.17	69.9	1.1	3.08	.17	67.2	0.8	17.05	0.51	79.9	2.7	31.44	.17	70.4	0.8
31.6	58.45	.18	29.8	2.8	16.07	.13	71.0	1.4	3.25	.13	68.0	0.5	17.56	0.33	82.6	3.0	31.61	.13	71.2	1.1
Apr. 10.5	58.63	.10	32.6	3.0	16.20	.10	72.4	1.7	3.38	.11	68.5	0.3	17.89	0.14	85.6	3.1	31.74	.10	72.3	1.3
20.5	58.73	.00	35.6	3.0	16.30	.06	74.1	1.8	3.49	.08	68.8	0.2	18.03	0.04	88.7	3.1	31.84	.07	73.6	1.4
30.5	58.73	.07	38.6	2.9	16.36	.02	75.9	1.9	3.57	.05	69.0	0.0	17.99	0.22	91.8	3.0	31.91	.03	75.0	1.6
May 10.5	58.66	.15	41.5	2.7	16.38	.00	77.8	1.8	3.62	.02	69.0	0.1	17.77	0.39	94.8	2.7	31.94	.01	76.6	1.5
20.4	58.51	.22	44.2	2.5	16.38	.03	79.6	1.8	3.64	.00	68.9	0.2	17.38	0.54	97.5	2.4	31.95	.02	78.1	1.5
30.4	58.29	.27	46.7	2.1	16.35	.06	81.4	1.6	3.64	.03	68.7	0.3	16.84	0.66	99.9	2.1	31.93	.05	79.6	1.4
June 9.4	58.02	.33	48.8	1.6	16.29	.08	83.0	1.4	3.61	.05	68.4	0.3	16.18	0.77	102.0	1.6	31.88	.07	81.0	1.3
19.4	57.69	.36	50.4	1.2	16.21	.10	84.4	1.2	3.56	.07	68.1	0.4	15.41	0.85	103.6	1.1	31.81	.09	82.3	1.1
29.3	57.33	.39	51.6	0.7	16.11	.12	85.6	0.9	3.49	.09	67.7	0.5	14.56	0.92	104.7	0.5	31.72	.11	83.4	0.8
July 9.3	56.94	.41	52.3	0.2	15.99	.13	86.5	0.6	3.40	.10	67.2	0.5	13.64	0.95	105.2	0.1	31.61	.12	84.2	0.6
19.3	56.53	.42	52.5	0.3	15.86	.14	87.1	0.3	3.30	.12	66.7	0.5	12.69	0.96	105.3	0.5	31.49	.13	84.8	0.4
29.2	56.11	.42	52.2	0.9	15.72	.15	87.4	0.0	3.18	.13	66.2	0.5	11.73	0.96	104.8	1.0	31.36	.14	85.2	0.1
Aug. 8.2	55.69	.40	51.3	1.3	15.57	.15	87.4	0.3	3.05	.13	65.7	0.4	10.77	0.93	103.8	1.6	31.22	.15	85.3	0.2
18.2	55.29	.38	50.0	1.9	15.42	.14	87.1	0.6	2.92	.12	65.3	0.4	9.84	0.88	102.2	2.0	31.07	.14	85.1	0.5
28.2	54.91	.34	48.1	2.3	15.28	.13	86.5	1.0	2.80	.11	64.9	0.4	8.96	0.80	100.2	2.5	30.93	.12	84.6	0.8
Sept. 7.1	54.57	.30	45.8	2.7	15.15	.11	85.5	1.3	2.69	.09	64.5	0.3	8.16	0.71	97.7	2.9	30.81	.11	83.8	1.1
17.1	54.27	.25	43.1	3.0	15.04	.08	84.2	1.7	2.60	.07	64.2	0.1	7.45	0.59	94.8	3.2	30.70	.08	82.7	1.4
27.1	54.02	.17	40.1	3.4	14.96	.05	82.5	1.9	2.53	.03	64.1	0.0	6.86	0.45	91.6	3.5	30.62	.05	81.3	1.7
Oct. 7.1	53.85	.09	36.7	3.6	14.91	.00	80.6	2.2	2.50	.01	64.1	0.2	6.41	0.31	88.1	3.7	30.57	.01	79.6	1.9
17.0	53.76	.01	33.1	3.8	14.91	.04	78.4	2.5	2.51	.06	64.3	0.4	6.10	0.14	84.4	3.9	30.56	.04	77.7	2.2
27.0	53.75	.09	29.3	3.9	14.95	.09	75.9	2.7	2.57	.10	64.7	0.7	5.96	0.04	80.5	4.0	30.60	.09	75.5	2.5
Nov. 6.0	53.84	.18	25.4	3.9	15.04	.14	73.2	2.8	2.67	.15	65.4	0.9	6.00	0.22	76.5	3.9	30.69	.13	73.0	2.6
15.9	54.02	.27	21.5	3.8	15.18	.19	70.4	2.9	2.82	.20	66.3	1.2	6.22	0.41	72.6	3.7	30.82	.18	70.4	2.7
25.9	54.29	.36	17.7	3.6	15.37	.24	67.5	3.0	3.02	.25	67.5	1.4	6.63	0.59	68.9	3.6	31.00	.23	67.7	2.8
Dec. 5.9	54.65	.45	14.1	3.3	15.61	.28	64.5	2.9	3.27	.28	68.9	1.6	7.22	0.75	65.3	3.2	31.23	.27	64.9	2.8
15.9	55.10	.51	10.8	2.8	15.89	.32	61.6	2.8	3.55	.31	70.5	1.8	7.97	0.90	62.1	2.7	31.50	.30	62.1	2.8
25.8	55.61	.57	8.0	2.4	16.21	.34	58.8	2.5	3.86	.33	72.3	1.9	8.87	1.01	59.4	2.3	31.80	.33	59.3	2.5
35.8	56.18		5.6		16.55		56.3		4.19		74.2		9.88		57.1		32.13		56.8	

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	δ Octantis.				λ Bootis.				λ Virginis.				θ Bootis.				5 Ursæ Minoris.			
	Right Ascension.		Declination South.		Right Ascension.		Declination North.		Right Ascension.		Declination South.		Right Ascension.		Declination North.		Right Ascension.		Declination North.	
	h m 14 12		° ′ −83 14		h m 14 12		° ′ +46 29		h m 14 14		° ′ −12 57		h m 14 22		° ′ +52 15		h m 14 27		° ′ +76 5	
	s		″		s		″		s		″		s		″		s		″	
Jan. 0.8	6.18	2.06	43.0	0.0	54.01	.40	71.9	2.3	9.34	.34	1.2	1.9	4.35	.43	65.7	2.4	39.84	0.91	49.3	2.1
10.8	8.24	2.11	43.0	0.5	54.41	.42	69.6	1.9	9.68	.34	3.1	1.9	4.78	.45	63.3	1.9	40.75	0.97	47.2	1.5
20.8	10.35	2.09	43.5	1.1	54.83	.42	67.7	1.2	10.02	.33	5.0	1.8	5.23	.46	61.4	1.2	41.72	1.00	45.7	0.9
30.7	12.44	2.01	44.6	1.6	55.25	.40	66.5	0.6	10.35	.31	6.8	1.8	5.69	.44	60.2	0.7	42.72	1.00	44.8	0.2
Feb. 9.7	14.45	1.90	46.2	2.2	55.65	.38	65.9	0.1	10.66	.30	8.6	1.7	6.13	.42	59.5	0.0	43.72	0.95	44.6	0.5
19.7	16.35	1.74	48.4	2.5	56.03	.34	65.8	0.6	10.96	.26	10.3	1.5	6.55	.39	59.5	0.7	44.67	0.88	45.1	1.1
Mar. 1.7	18.09	1.54	50.9	2.9	56.37	.31	66.4	1.1	11.22	.24	11.8	1.3	6.94	.34	60.2	1.2	45.55	0.79	46.2	1.7
11.6	19.63	1.32	53.8	3.2	56.68	.25	67.5	1.6	11.46	.21	13.1	1.1	7.28	.29	61.4	1.7	46.34	0.66	47.9	2.3
21.6	20.95	1.08	57.0	3.5	56.93	.21	69.1	2.0	11.67	.18	14.2	0.9	7.57	.23	63.1	2.1	47.00	0.51	50.2	2.6
31.6	22.03	0.83	60.5	3.6	57.14	.15	71.1	2.4	11.85	.14	15.1	0.7	7.80	.18	65.2	2.5	47.51	0.36	52.8	2.9
Apr. 10.5	22.86	0.55	64.1	3.6	57.29	.10	73.5	2.5	11.99	.11	15.8	0.5	7.98	.12	67.7	2.7	47.87	0.20	55.7	3.0
20.5	23.41	0.27	67.7	3.6	57.39	.06	76.0	2.6	12.10	.08	16.3	0.4	8.10	.06	70.4	2.8	48.07	0.04	58.7	3.1
30.5	23.68	0.00	71.3	3.5	57.45	.00	78.6	2.6	12.18	.06	16.7	0.2	8.16	.00	73.2	2.7	48.11	0.12	61.8	3.1
May 10.5	23.68	0.28	74.8	3.4	57.45	.04	81.2	2.5	12.24	.03	16.9	0.0	8.16	.04	75.9	2.7	47.99	0.26	64.9	2.8
20.4	23.40	0.55	78.2	3.1	57.41	.08	83.7	2.4	12.27	.00	16.9	0.0	8.12	.09	78.6	2.5	47.73	0.40	67.7	2.6
30.4	22.85	0.81	81.3	2.9	57.33	.11	86.1	2.1	12.27	.02	16.9	0.2	8.03	.14	81.1	2.2	47.33	0.51	70.3	2.3
June 9.4	22.04	1.04	84.2	2.5	57.22	.14	88.2	1.8	12.25	.05	16.7	0.2	7.89	.17	83.3	1.9	46.82	0.62	72.6	1.8
19.4	21.00	1.24	86.7	2.0	57.08	.18	90.0	1.4	12.20	.07	16.5	0.3	7.72	.21	85.2	1.5	46.20	0.70	74.4	1.4
29.3	19.76	1.42	88.7	1.6	56.90	.19	91.4	1.0	12.13	.08	16.2	0.4	7.51	.23	86.7	1.1	45.50	0.77	75.8	0.9
July 9.3	18.34	1.55	90.3	1.0	56.71	.21	92.4	0.6	12.05	.11	15.8	0.4	7.28	.25	87.8	0.6	44.73	0.81	76.7	0.3
19.3	16.79	1.64	91.3	0.5	56.50	.22	93.0	0.1	11.94	.12	15.4	0.5	7.03	.27	88.4	0.1	43.92	0.84	77.0	0.2
29.3	15.15	1.67	91.8	0.1	56.28	.23	93.1	0.4	11.82	.13	14.9	0.5	6.76	.27	88.5	0.4	43.08	0.84	76.8	0.7
Aug. 8.2	13.48	1.65	91.7	0.6	56.05	.23	92.7	0.8	11.69	.13	14.4	0.5	6.49	.28	88.1	0.8	42.24	0.83	76.1	1.3
18.2	11.83	1.56	91.1	1.2	55.82	.22	91.9	1.2	11.56	.13	13.9	0.5	6.21	.26	87.3	1.3	41.41	0.80	74.8	1.8
28.2	10.27	1.42	89.9	1.6	55.60	.20	90.7	1.7	11.43	.11	13.4	0.4	5.95	.24	86.0	1.8	40.61	0.74	73.0	2.2
Sept. 7.1	8.85	1.21	88.3	2.2	55.40	.17	89.0	2.0	11.32	.10	13.0	0.4	5.71	.21	84.2	2.2	39.87	0.67	70.8	2.6
17.1	7.64	0.96	86.1	2.5	55.23	.14	87.0	2.5	11.22	.07	12.6	0.3	5.50	.18	82.0	2.6	39.20	0.58	68.2	3.0
27.1	6.68	0.66	83.6	2.7	55.09	.09	84.5	2.8	11.15	.04	12.3	0.1	5.32	.13	79.4	2.9	38.62	0.46	65.2	3.4
Oct. 7.1	6.02	0.32	80.9	3.0	55.00	.05	81.7	3.1	11.11	.01	12.2	0.0	5.19	.08	76.5	3.3	38.16	0.34	61.8	3.6
17.0	5.70	0.04	77.9	3.0	54.95	.01	78.6	3.3	11.12	.05	12.2	0.2	5.11	.02	73.2	3.5	37.82	0.19	58.2	3.9
27.0	5.74	0.41	74.9	2.9	54.96	.07	75.3	3.5	11.17	.10	12.4	0.5	5.09	.05	69.7	3.6	37.63	0.04	54.3	3.9
Nov. 6.0	6.15	0.77	72.0	2.7	55.03	.14	71.8	3.6	11.27	.15	12.9	0.7	5.14	.13	66.1	3.8	37.59	0.12	50.4	3.9
16.0	6.92	1.11	69.3	2.5	55.17	.20	68.2	3.6	11.42	.20	13.6	1.0	5.27	.19	62.3	3.7	37.71	0.29	46.5	3.9
25.9	8.03	1.41	66.8	2.0	55.37	.26	64.6	3.5	11.62	.24	14.6	1.3	5.46	.26	58.6	3.6	38.00	0.45	42.6	3.6
Dec. 5.9	9.44	1.68	64.8	1.5	55.63	.31	61.1	3.3	11.86	.28	15.9	1.5	5.72	.32	55.0	3.4	38.45	0.60	39.0	3.4
15.9	11.12	1.87	63.3	1.0	55.94	.36	57.8	3.0	12.14	.30	17.4	1.6	6.04	.38	51.6	3.2	39.05	0.74	35.6	3.0
25.8	12.99	2.02	62.3	0.5	56.30	.39	54.8	2.6	12.44	.33	19.0	1.8	6.42	.41	48.4	2.7	39.79	0.84	32.6	2.5
35.8	15.01		61.8		56.69		52.2		12.77		20.8		6.83		45.7		40.63		30.1	

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	ρ Bootis.				α^2 Centauri.				33 Bootis.				α Apodis.				ε Bootis.			
	Right Ascension.		Declination *North.*		Right Ascension.		Declination *South.*		Right Ascension.		Declination *North.*		Right Ascension.		Declination *South.*		Right Ascension.		Declination *North.*	
	h m 14 27		° ′ +30 45		h m 14 33		° ′ −60 27		h m 14 35		° ′ +44 47		h m 14 36		° ′ −78 39		h m 14 40		° ′ +27 27	
	s		″		s		″		s		″		s		″		s		″	
Jan. 0.8	52.94	.34	68.4	2.4	21.77	.55	17.0	0.3	25.44	.38	40.0	2.5	24.78	1.27	11.1	0.3	59.13	.33	22.2	2.5
10.8	53.28	.36	66.0	2.1	22.32	.57	17.3	0.8	25.82	.40	37.5	2.1	26.05	1.30	10.8	0.3	59.46	.34	19.7	2.2
20.8	53.64	.35	63.9	1.7	22.89	.56	18.1	1.2	26.22	.40	35.4	1.5	27.35	1.32	11.1	0.8	59.80	.35	17.5	1.7
30.8	53.99	.35	62.2	1.1	23.45	.55	19.3	1.6	26.62	.40	33.9	0.9	28.67	1.28	11.9	1.3	60.15	.34	15.8	1.2
Feb. 9.7	54.34	.32	61.1	0.5	24.00	.52	20.9	2.0	27.02	.38	33.0	0.3	29.95	1.24	13.2	1.9	60.49	.32	14.6	0.8
19.7	54.66	.30	60.6	0.1	24.52	.48	22.9	2.2	27.40	.35	32.7	0.3	31.19	1.15	15.1	2.3	60.81	.30	13.8	0.3
Mar. 1.7	54.96	.27	60.5	0.5	25.00	.44	25.1	2.5	27.75	.31	33.0	0.9	32.34	1.04	17.4	2.6	61.11	.27	13.5	0.3
11.6	55.23	.23	61.0	0.9	25.44	.38	27.6	2.7	28.06	.27	33.9	1.4	33.38	0.93	20.0	2.9	61.38	.24	13.8	0.8
21.6	55.46	.19	61.9	1.3	25.82	.33	30.3	2.8	28.33	.23	35.3	1.8	34.31	0.79	22.9	3.2	61.62	.20	14.6	1.1
31.6	55.65	.16	63.2	1.6	26.15	.27	33.1	2.9	28.56	.18	37.1	2.2	35.10	0.64	26.1	3.3	61.82	.17	15.7	1.5
Apr. 10.6	55.81	.12	64.8	1.9	26.42	.21	36.0	2.9	28.74	.13	39.3	2.5	35.74	0.49	29.4	3.4	61.99	.13	17.2	1.7
20.5	55.93	.08	66.7	2.1	26.63	.15	38.9	2.9	28.87	.09	41.8	2.6	36.23	0.32	32.8	3.5	62.12	.09	18.9	1.9
30.5	56.01	.04	68.8	2.1	26.78	.09	41.8	2.7	28.96	.03	44.4	2.6	36.55	0.16	36.3	3.4	62.21	.06	20.8	2.0
May 10.5	56.05	.01	70.9	2.2	26.87	.03	44.5	2.6	28.99	.01	47.0	2.6	36.71	0.00	39.7	3.3	62.27	.03	22.8	2.1
20.5	56.06	.02	73.1	2.0	26.90	.03	47.1	2.4	28.98	.04	49.6	2.4	36.71	0.17	43.0	3.1	62.30	.01	24.9	2.0
30.4	56.04	.06	75.1	1.9	26.87	.09	49.5	2.1	28.94	.09	52.0	2.3	36.54	0.33	46.1	2.9	62.29	.03	26.9	1.8
June 9.4	55.98	.08	77.0	1.7	26.78	.15	51.6	1.8	28.85	.12	54.3	1.9	36.21	0.48	49.0	2.5	62.26	.07	28.7	1.7
19.4	55.90	.10	78.7	1.4	26.63	.21	53.4	1.5	28.73	.15	56.2	1.6	35.73	0.61	51.5	2.2	62.19	.09	30.4	1.4
29.3	55.80	.13	80.1	1.1	26.42	.25	54.9	1.2	28.58	.18	57.8	1.3	35.12	0.74	53.7	1.7	62.10	.11	31.8	1.2
July 9.3	55.67	.14	81.2	0.8	26.17	.29	56.1	0.7	28.40	.20	59.1	0.8	34.38	0.84	55.4	1.2	61.99	.13	33.0	0.9
19.3	55.53	.16	82.0	0.4	25.88	.32	56.8	0.3	28.20	.21	59.9	0.4	33.54	0.91	56.6	0.7	61.86	.15	33.9	0.6
29.3	55.37	.17	82.4	0.1	25.56	.35	57.1	0.2	27.99	.23	60.3	0.1	32.63	0.95	57.3	0.2	61.71	.16	34.5	0.2
Aug. 8.2	55.20	.16	82.5	0.3	25.21	.35	56.9	0.6	27.76	.23	60.2	0.5	31.68	0.97	57.5	0.4	61.55	.17	34.7	0.2
18.2	55.04	.17	82.2	0.7	24.86	.34	56.3	1.0	27.53	.23	59.7	1.0	30.71	0.94	57.1	0.9	61.38	.16	34.5	0.5
28.2	54.87	.16	81.5	1.0	24.52	.32	55.3	1.4	27.30	.21	58.7	1.4	29.77	0.87	56.2	1.4	61.22	.16	34.0	0.8
Sept. 7.2	54.71	.14	80.5	1.4	24.20	.28	53.9	1.7	27.09	.19	57.3	1.9	28.90	0.77	54.8	1.9	61.06	.14	33.2	1.2
17.1	54.57	.11	79.1	1.8	23.92	.23	52.2	2.1	26.90	.16	55.4	2.2	28.13	0.64	52.9	2.2	60.92	.12	32.0	1.5
27.1	54.46	.07	77.3	2.1	23.69	.16	50.1	2.2	26.74	.12	53.2	2.6	27.49	0.47	50.7	2.6	60.80	.09	30.5	1.9
Oct. 7.1	54.39	.04	75.2	2.4	23.53	.08	47.9	2.3	26.62	.07	50.6	2.9	27.02	0.27	48.1	2.8	60.71	.04	28.6	2.2
17.0	54.35	.01	72.8	2.6	23.45	.01	45.6	2.3	26.55	.02	47.7	3.2	26.75	0.06	45.3	2.8	60.67	.00	26.4	2.5
27.0	54.36	.06	70.2	2.9	23.46	.10	43.3	2.2	26.53	.04	44.5	3.4	26.69	0.17	42.5	2.9	60.67	.04	23.9	2.7
Nov. 6.0	54.42	.12	67.3	3.1	23.56	.20	41.1	2.0	26.57	.10	41.1	3.6	26.86	0.39	39.6	2.7	60.71	.11	21.2	2.9
16.0	54.54	.17	64.2	3.1	23.76	.28	39.1	1.8	26.67	.17	37.5	3.6	27.25	0.61	36.9	2.5	60.82	.15	18.3	3.0
25.9	54.71	.22	61.1	3.2	24.04	.37	37.3	1.4	26.84	.22	33.9	3.5	27.86	0.80	34.4	2.1	60.97	.21	15.3	3.1
Dec. 5.9	54.93	.27	57.9	3.1	24.41	.45	35.9	1.0	27.06	.28	30.4	3.4	28.66	0.98	32.3	1.7	61.18	.25	12.2	3.0
15.9	55.20	.30	54.8	2.9	24.86	.50	34.9	0.5	27.34	.33	27.0	3.2	29.64	1.12	30.6	1.1	61.43	.29	9.2	3.0
25.9	55.50	.33	51.9	2.7	25.36	.54	34.4	0.0	27.67	.37	23.8	2.8	30.76	1.22	29.5	0.7	61.72	.32	6.2	2.7
35.8	55.83		49.2		25.90		34.4		28.04		21.0		31.98		28.8		62.04		3.5	

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α² Libræ.				β Ursæ Minoris.				β Bootis.				γ Scorpii.				δ Bootis.			
	Right Ascension.		Declination *South.*		Right Ascension.		Declination *North.*		Right Ascension.		Declination *North.*		Right Ascension.		Declination *South.*		Right Ascension.		Declination *North.*	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	14 45		−15 39		14 50		+74 31		14 58		+40 44		14 58		−24 55		15 11		+33 38	
	s		″		s		″		s		″		s		″		s		″	
Jan. 0.8	48.65	.33	42.5	1.7	55.06	.78	26.3	2.4	29.34	.35	49.2	2.7	42.45	.34	18.8	1.2	48.25	.33	67.9	2.7
10.8	48.98	.33	44.2	1.7	55.84	.85	23.9	1.9	29.69	.37	46.5	2.2	42.79	.35	20.0	1.4	48.58	.34	65.2	2.3
20.8	49.31	.34	45.9	1.7	56.69	.89	22.0	1.2	30.06	.38	44.3	1.8	43.14	.35	21.4	1.5	48.92	.35	62.9	1.9
30.8	49.65	.33	47.6	1.6	57.58	.91	20.8	0.5	30.44	.38	42.5	1.2	43.49	.35	22.9	1.6	49.27	.35	61.0	1.4
Feb. 9.7	49.98	.31	49.2	1.6	58.49	.88	20.3	0.2	30.82	.36	41.3	0.6	43.84	.33	24.5	1.7	49.62	.34	59.6	0.9
19.7	50.29	.29	50.8	1.5	59.37	.83	20.5	0.8	31.18	.35	40.7	0.0	44.17	.31	26.2	1.6	49.96	.33	58.7	0.3
Mar. 1.7	50.58	.26	52.3	1.3	60.20	.76	21.3	1.4	31.53	.31	40.7	0.6	44.48	.28	27.8	1.5	50.29	.30	58.4	0.3
11.7	50.84	.24	53.6	1.1	60.96	.65	22.7	2.0	31.84	.28	41.3	1.1	44.76	.26	29.3	1.4	50.59	.28	58.7	0.8
21.6	51.08	.20	54.7	1.0	61.61	.54	24.7	2.4	32.12	.24	42.4	1.6	45.02	.23	30.7	1.3	50.87	.24	59.5	1.3
31.6	51.28	.18	55.7	0.8	62.15	.40	27.1	2.8	32.36	.20	44.0	2.0	45.25	.20	32.0	1.2	51.11	.20	60.8	1.6
Apr. 10.6	51.46	.14	56.5	0.6	62.55	.26	29.9	3.0	32.56	.16	46.0	2.2	45.45	.17	33.2	1.1	51.31	.16	62.4	2.0
20.5	51.60	.12	57.1	0.4	62.81	.12	32.9	3.1	32.72	.11	48.2	2.5	45.62	.14	34.3	1.0	51.47	.13	64.4	2.2
30.5	51.72	.09	57.5	0.3	62.93	.02	36.0	3.1	32.83	.07	50.7	2.5	45.76	.11	35.3	0.8	51.60	.09	66.6	2.3
May 10.5	51.81	.06	57.8	0.2	62.91	.16	39.1	2.9	32.90	.03	53.2	2.6	45.87	.08	36.1	0.7	51.69	.05	68.9	2.4
20.5	51.87	.03	58.0	0.1	62.75	.28	42.0	2.8	32.93	.02	55.8	2.5	45.95	.05	36.8	0.6	51.74	.01	71.3	2.3
30.4	51.90	.00	58.1	0.0	62.47	.40	44.8	2.5	32.91	.05	58.3	2.3	46.00	.01	37.4	0.5	51.75	.02	73.6	2.2
June 9.4	51.90	.02	58.1	0.1	62.07	.50	47.3	2.1	32.86	.09	60.6	2.1	46.01	.02	37.9	0.4	51.73	.05	75.8	2.0
19.4	51.88	.05	58.0	0.2	61.57	.59	49.4	1.7	32.77	.12	62.7	1.8	45.99	.05	38.3	0.2	51.68	.09	77.8	1.8
29.4	51.83	.07	57.8	0.2	60.98	.66	51.1	1.2	32.65	.15	64.5	1.4	45.94	.07	38.5	0.1	51.59	.12	79.6	1.5
July 9.3	51.76	.10	57.6	0.3	60.32	.72	52.3	0.7	32.50	.17	65.9	1.0	45.87	.10	38.6	0.0	51.47	.14	81.1	1.2
19.3	51.66	.12	57.3	0.4	59.60	.75	53.0	0.1	32.33	.19	66.9	0.7	45.77	.13	38.6	0.2	51.33	.16	82.3	0.8
29.3	51.54	.13	56.9	0.4	58.85	.77	53.1	0.3	32.14	.21	67.6	0.2	45.64	.14	38.4	0.3	51.17	.19	83.1	0.4
Aug. 8.2	51.41	.14	56.5	0.4	58.08	.77	52.8	0.9	31.93	.22	67.8	0.2	45.50	.15	38.1	0.4	50.98	.19	83.5	0.0
18.2	51.27	.14	56.1	0.5	57.31	.75	51.9	1.4	31.71	.22	67.6	0.7	45.35	.16	37.7	0.6	50.79	.19	83.5	0.4
28.2	51.13	.14	55.6	0.4	56.56	.72	50.5	1.9	31.49	.21	66.9	1.1	45.19	.15	37.1	0.6	50.60	.20	83.1	0.8
Sept. 7.2	50.99	.12	55.2	0.4	55.84	.66	48.6	2.4	31.28	.20	65.8	1.5	45.04	.14	36.5	0.7	50.40	.18	82.3	1.2
17.1	50.87	.10	54.8	0.4	55.18	.59	46.2	2.8	31.08	.17	64.3	1.9	44.90	.12	35.8	0.7	50.22	.16	81.1	1.6
27.1	50.77	.07	54.4	0.3	54.59	.50	43.4	3.1	30.91	.13	62.4	2.3	44.78	.08	35.1	0.7	50.06	.12	79.5	2.0
Oct. 7.1	50.70	.02	54.1	0.1	54.09	.38	40.3	3.5	30.78	.09	60.1	2.6	44.70	.04	34.4	0.6	49.94	.09	77.5	2.3
17.1	50.68	.02	54.0	0.1	53.71	.26	36.8	3.7	30.69	.05	57.5	3.0	44.66	.00	33.8	0.5	49.85	.05	75.2	2.6
27.0	50.70	.06	54.1	0.2	53.45	.12	33.1	3.8	30.64	.01	54.5	3.2	44.66	.06	33.3	0.3	49.80	.00	72.6	2.9
Nov. 6.0	50.76	.13	54.3	0.5	53.33	.02	29.3	4.0	30.65	.08	51.3	3.4	44.72	.12	33.0	0.1	49.80	.06	69.7	3.1
16.0	50.89	.17	54.8	0.7	53.35	.18	25.3	3.9	30.73	.13	47.9	3.5	44.84	.17	32.9	0.1	49.86	.12	66.6	3.2
25.9	51.06	.22	55.5	1.0	53.53	.33	21.4	3.7	30.86	.19	44.4	3.5	45.01	.22	33.0	0.4	49.98	.18	63.4	3.3
Dec. 5.9	51.28	.26	56.5	1.2	53.86	.47	17.7	3.6	31.05	.25	40.9	3.4	45.23	.26	33.4	0.6	50.16	.22	60.1	3.3
15.9	51.54	.29	57.7	1.4	54.33	.60	14.1	3.2	31.30	.29	37.5	3.2	45.49	.30	34.0	0.9	50.38	.27	56.8	3.1
25.9	51.83	.32	59.1	1.6	54.93	.72	10.9	2.7	31.59	.33	34.3	3.0	45.79	.33	34.9	1.1	50.65	.30	53.7	3.0
35.8	52.15		60.7		55.65		8.2		31.92		31.3		46.12		36.0		50.95		50.7	

(CONSTANTS OF STRUVE AND PETERS.)

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	β Libræ.				γ² Ursæ Minoris.				μ¹ Bootis.				ρ Octantis.				β Coronæ Borealis.			
	Right Ascension.		Declination *South.*		Right Ascension.		Declination *North.*		Right Ascension.		Declination *North.*		Right Ascension.		Declination *South.*		Right Ascension.		Declination *North.*	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	15 12		− 9 2		15 20		+72 9		15 21		+37 41		15 21		−84 9		15 24		+29 24	
	s		″		s		″		s		″		s		″		s		″	
Jan. 0.9	4.57	.31	46.2	1.7	49.20	.63	16.8	2.8	1.30	.33	38.6	2.8	56.90	2.22	30.5	1.1	2.79	.30	63.3	2.7
10.8	4.88	.32	47.9	1.7	49.83	.71	14.0	2.3	1.63	.34	35.8	2.4	59.12	2.39	29.4	0.6	3.09	.33	60.6	2.4
20.8	5.20	.33	49.6	1.7	50.54	.76	11.7	1.6	1.97	.36	33.4	2.0	61.51	2.49	28.8	0.0	3.42	.34	58.2	2.0
30.8	5.53	.32	51.3	1.6	51.30	.78	10.1	1.0	2.33	.37	31.4	1.4	64.00	2.52	28.8	0.5	3.76	.34	56.2	1.5
Feb. 9.8	5.85	.31	52.9	1.4	52.08	.79	9.1	0.3	2.70	.36	30.0	0.9	66.52	2.49	29.3	1.1	4.10	.33	54.7	1.0
19.7	6.16	.29	54.3	1.2	52.87	.76	8.8	0.4	3.06	.34	29.1	0.2	69.01	2.40	30.4	1.6	4.43	.32	53.7	0.4
Mar. 1.7	6.45	.27	55.5	1.0	53.63	.70	9.2	1.1	3.40	.31	28.9	0.3	71.41	2.27	32.0	2.0	4.75	.30	53.3	0.1
11.7	6.72	.25	56.5	0.8	54.33	.63	10.3	1.6	3.71	.29	29.2	0.9	73.68	2.09	34.0	2.4	5.05	.27	53.4	0.6
21.6	6.97	.22	57.3	0.6	54.96	.54	11.9	2.1	4.00	.26	30.1	1.3	75.77	1.87	36.4	2.7	5.32	.24	54.0	1.0
31.6	7.19	.20	57.9	0.3	55.50	.44	14.0	2.6	4.26	.21	31.4	1.8	77.64	1.61	39.1	3.0	5.56	.21	55.0	1.5
Apr. 10.6	7.39	.17	58.2	0.2	55.94	.32	16.6	2.9	4.47	.18	33.2	2.1	79.25	1.34	42.1	3.2	5.77	.17	56.5	1.8
20.6	7.56	.14	58.4	0.0	56.26	.20	19.5	3.0	4.65	.14	35.3	2.4	80.59	1.03	45.3	3.4	5.94	.14	58.3	2.0
30.5	7.70	.11	58.4	0.2	56.46	.08	22.5	3.2	4.79	.09	37.7	2.5	81.62	0.71	48.7	3.4	6.08	.10	60.3	2.2
May 10.5	7.81	.08	58.2	0.2	56.54	.04	25.7	3.1	4.88	.06	40.2	2.5	82.33	0.38	52.1	3.4	6.18	.07	62.5	2.2
20.5	7.89	.06	58.0	0.3	56.50	.16	28.8	2.9	4.94	.02	42.7	2.5	82.71	0.04	55.5	3.4	6.25	.03	64.7	2.2
30.5	7.95	.02	57.7	0.4	56.34	.26	31.7	2.8	4.96	.02	45.2	2.4	82.75	0.30	58.9	3.2	6.28	.00	66.9	2.2
June 9.4	7.97	.00	57.3	0.4	56.08	.37	34.5	2.4	4.94	.06	47.6	2.2	82.45	0.64	62.1	3.0	6.28	.04	69.1	2.0
19.4	7.97	.04	56.9	0.5	55.71	.45	36.9	2.0	4.88	.10	49.8	1.9	81.81	0.94	65.1	2.7	6.24	.07	71.1	1.8
29.4	7.93	.06	56.4	0.4	55.26	.53	38.9	1.6	4.78	.12	51.7	1.6	80.87	1.23	67.8	2.3	6.17	.09	72.9	1.5
July 9.3	7.87	.09	56.0	0.4	54.73	.59	40.5	1.1	4.66	.16	53.3	1.2	79.64	1.48	70.1	1.8	6.08	.13	74.4	1.2
19.3	7.78	.10	55.6	0.4	54.14	.64	41.6	0.7	4.50	.17	54.5	0.9	78.16	1.69	71.9	1.4	5.95	.15	75.6	0.9
29.3	7.68	.13	55.2	0.4	53.50	.67	42.3	0.1	4.33	.20	55.4	0.5	76.47	1.84	73.3	0.9	5.80	.17	76.5	0.5
Aug. 8.3	7.55	.14	54.8	0.4	52.83	.68	42.4	0.4	4.13	.21	55.9	0.1	74.63	1.92	74.2	0.3	5.63	.18	77.0	0.2
18.2	7.41	.15	54.4	0.3	52.15	.69	42.0	1.0	3.92	.22	56.0	0.4	72.71	1.95	74.5	0.2	5.45	.19	77.2	0.2
28.2	7.26	.14	54.1	0.2	51.46	.67	41.0	1.4	3.70	.21	55.6	0.8	70.76	1.89	74.3	0.8	5.26	.19	77.0	0.6
Sept. 7.2	7.12	.13	53.9	0.2	50.79	.63	39.6	2.0	3.49	.20	54.8	1.2	68.87	1.75	73.5	1.4	5.07	.17	76.4	1.0
17.2	6.99	.11	53.7	0.1	50.16	.58	37.6	2.4	3.29	.18	53.6	1.7	67.12	1.55	72.1	1.9	4.90	.16	75.4	1.3
27.1	6.88	.09	53.6	0.1	49.58	.51	35.2	2.8	3.11	.15	51.9	2.0	65.57	1.29	70.2	2.3	4.74	.13	74.1	1.7
Oct. 7.1	6.79	.05	53.7	0.3	49.07	.42	32.4	3.1	2.96	.11	49.9	2.4	64.28	0.95	67.9	2.6	4.61	.10	72.4	2.1
17.1	6.74	.01	54.0	0.4	48.65	.31	29.3	3.5	2.85	.07	47.5	2.7	63.33	0.57	65.3	2.8	4.51	.05	70.3	2.4
27.0	6.73	.04	54.4	0.6	48.34	.20	25.8	3.7	2.78	.01	44.8	3.0	62.76	0.15	62.5	3.0	4.46	.00	67.9	2.6
Nov. 6.0	6.77	.09	55.0	0.8	48.14	.07	22.1	3.9	2.77	.04	41.8	3.2	62.61	0.27	59.5	3.0	4.46	.05	65.3	2.9
16.0	6.86	.14	55.8	1.1	48.07	.06	18.2	3.9	2.81	.10	38.6	3.4	62.88	0.71	56.5	2.9	4.51	.10	62.4	3.1
26.0	7.00	.19	56.9	1.3	48.13	.20	14.3	3.9	2.91	.16	35.2	3.4	63.59	1.12	53.6	2.6	4.61	.16	59.3	3.1
Dec. 5.9	7.19	.23	58.2	1.4	48.33	.34	10.4	3.7	3.07	.22	31.8	3.4	64.71	1.50	51.0	2.3	4.77	.21	56.2	3.2
15.9	7.42	.27	59.6	1.6	48.67	.46	6.7	3.5	3.29	.26	28.4	3.3	66.21	1.83	48.7	1.9	4.98	.25	53.0	3.1
25.9	7.69	.30	61.2	1.7	49.13	.56	3.2	3.1	3.55	.31	25.1	3.0	68.04	2.10	46.8	1.5	5.23	.29	49.9	2.9
35.9	7.99		62.9		49.69		0.1		3.86		22.1		70.14		45.3		5.52		47.0	

(CONSTANTS OF STRUVE AND PETERS.)

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Coronæ Borealis.				α Serpentis.				ε Serpentis.				ζ Ursæ Minoris.				ε Coronæ Borealis.			
	Right Ascension.		Declination *North.*		Right Ascension.		Declination *North.*		Right Ascension.		Declination *North.*		Right Ascension.		Declination *North.*		Right Ascension.		Declination *North.*	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	15 30		+27 0		15 39		+ 6 42		15 46		+ 4 44		15 47		+78 4		15 53		+27 8	
	s		″		s		″		s		″		s		″		s		″	
Jan. 0.9	48.21	.30	69.3	2.7	45.13	.29	41.5	2.2	14.74	.28	65.2	2.1	13.32	0.78	18.7	2.9	47.19	.28	22.9	2.8
10.9	48.51	.32	66.6	2.4	45.42	.30	39.3	2.0	15.02	.30	63.1	2.0	14.10	0.92	15.8	2.5	47.47	.30	20.1	2.5
20.8	48.83	.33	64.2	2.0	45.72	.31	37.3	1.9	15.32	.31	61.1	1.8	15.02	1.03	13.3	1.9	47.77	.32	17.6	2.1
30.8	49.16	.33	62.2	1.6	46.03	.32	35.4	1.6	15.63	.31	59.3	1.6	16.05	1.09	11.4	1.2	48.09	.33	15.5	1.7
Feb. 9.8	49.49	.33	60.6	1.1	46.35	.31	33.8	1.2	15.94	.31	57.7	1.2	17.14	1.12	10.2	0.6	48.42	.33	13.8	1.2
19.7	49.82	.32	59.5	0.5	46.66	.29	32.6	0.9	16.25	.30	56.5	1.0	18.26	1.11	9.6	0.1	48.75	.32	12.6	0.6
Mar. 1.7	50.14	.29	59.0	0.0	46.95	.28	31.7	0.6	16.55	.28	55.5	0.6	19.37	1.05	9.7	0.8	49.07	.31	12.0	0.2
11.7	50.43	.27	59.0	0.5	47.23	.26	31.1	0.2	16.83	.26	54.9	0.2	20.42	0.97	10.5	1.4	49.38	.28	11.8	0.4
21.7	50.70	.25	59.5	0.9	47.49	.24	30.9	0.2	17.09	.24	54.7	0.1	21.39	0.85	11.9	1.9	49.66	.26	12.2	0.9
31.6	50.95	.21	60.4	1.3	47.73	.21	31.1	0.4	17.33	.22	54.8	0.3	22.24	0.70	13.8	2.4	49.92	.23	13.1	1.3
Apr. 10.6	51.16	.18	61.7	1.7	47.94	.19	31.5	0.8	17.55	.19	55.1	0.7	22.94	0.54	16.2	2.8	50.15	.20	14.4	1.6
20.6	51.34	.15	63.4	1.9	48.13	.15	32.3	0.9	17.74	.17	55.8	0.8	23.48	0.37	19.0	3.0	50.35	.17	16.0	1.9
30.6	51.49	.11	65.3	2.1	48.28	.13	33.2	1.1	17.91	.13	56.6	1.0	23.85	0.18	22.0	3.1	50.52	.13	17.9	2.1
May 10.5	51.60	.07	67.4	2.2	48.41	.10	34.3	1.2	18.04	.11	57.6	1.2	24.03	0.00	25.1	3.1	50.65	.10	20.0	2.2
20.5	51.67	.04	69.6	2.1	48.51	.07	35.5	1.3	18.15	.08	58.8	1.1	24.03	0.18	28.2	3.0	50.75	.06	22.2	2.2
30.5	51.71	.01	71.7	2.1	48.58	.04	36.8	1.2	18.23	.04	59.9	1.2	23.85	0.35	31.2	2.9	50.81	.03	24.4	2.2
June 9.4	51.72	.02	73.8	2.0	48.62	.01	38.0	1.2	18.27	.02	61.1	1.2	23.50	0.51	34.1	2.6	50.84	.00	26.6	2.1
19.4	51.70	.06	75.8	1.7	48.63	.03	39.2	1.2	18.29	.02	62.3	1.0	22.99	0.66	36.7	2.3	50.84	.04	28.7	1.9
29.4	51.64	.09	77.5	1.6	48.60	.05	40.4	1.0	18.27	.05	63.3	1.0	22.33	0.79	39.0	1.8	50.80	.08	30.6	1.7
July 9.4	51.55	.11	79.1	1.2	48.55	.08	41.4	0.9	18.22	.07	64.3	0.8	21.54	0.89	40.8	1.4	50.72	.10	32.3	1.4
19.3	51.44	.14	80.3	0.9	48.47	.10	42.3	0.7	18.15	.10	65.1	0.7	20.65	0.97	42.2	0.9	50.62	.14	33.7	1.1
29.3	51.30	.16	81.2	0.6	48.37	.13	43.0	0.5	18.05	.13	65.8	0.6	19.68	1.04	43.1	0.4	50.48	.16	34.8	0.8
Aug. 8.3	51.14	.18	81.8	0.2	48.24	.14	43.5	0.4	17.92	.14	66.4	0.4	18.64	1.08	43.5	0.1	50.32	.17	35.6	0.4
18.3	50.96	.18	82.0	0.1	48.10	.16	43.9	0.2	17.78	.15	66.8	0.2	17.56	1.09	43.4	0.6	50.15	.19	36.0	0.0
28.2	50.78	.19	81.9	0.5	47.94	.15	44.1	0.1	17.63	.16	67.0	0.1	16.47	1.08	42.8	1.2	49.96	.19	36.0	0.3
Sept. 7.2	50.59	.17	81.4	0.9	47.79	.15	44.0	0.3	17.47	.15	66.9	0.2	15.39	1.04	41.6	1.6	49.77	.19	35.7	0.7
17.2	50.42	.16	80.5	1.2	47.64	.13	43.7	0.5	17.32	.13	66.7	0.4	14.35	0.98	40.0	2.1	49.58	.17	35.0	1.1
27.1	50.26	.13	79.3	1.6	47.51	.11	43.2	0.7	17.19	.12	66.3	0.6	13.37	0.88	37.9	2.6	49.41	.15	33.9	1.4
Oct. 7.1	50.13	.09	77.7	1.9	47.40	.08	42.5	1.0	17.07	.08	65.7	0.9	12.49	0.77	35.3	2.9	49.26	.12	32.5	1.8
17.1	50.04	.06	75.8	2.3	47.32	.04	41.5	1.2	16.99	.04	64.8	1.1	11.72	0.63	32.4	3.3	49.14	.08	30.7	2.1
27.1	49.98	.01	73.5	2.5	47.28	.01	40.3	1.5	16.95	.00	63.7	1.4	11.09	0.47	29.1	3.5	49.06	.04	28.6	2.5
Nov. 6.0	49.97	.05	71.0	2.8	47.29	.05	38.8	1.7	16.95	.05	62.3	1.6	10.62	0.29	25.6	3.7	49.02	.02	26.1	2.7
16.0	50.02	.10	68.2	2.9	47.34	.10	37.1	1.9	17.00	.09	60.7	1.7	10.33	0.09	21.9	3.9	49.04	.07	23.4	2.9
26.0	50.12	.15	65.3	3.1	47.44	.15	35.2	2.1	17.09	.15	59.0	2.0	10.24	0.11	18.0	3.8	49.11	.13	20.5	3.0
Dec. 6.0	50.27	.20	62.2	3.1	47.59	.20	33.1	2.2	17.24	.19	57.0	2.1	10.35	0.30	14.2	3.8	49.24	.18	17.5	3.1
15.9	50.47	.25	59.1	3.0	47.79	.24	30.9	2.3	17.43	.24	54.9	2.1	10.65	0.50	10.4	3.5	49.42	.22	14.4	3.0
25.9	50.72	.28	56.1	2.9	48.03	.27	28.6	2.2	17.67	.26	52.8	2.2	11.15	0.68	6.9	3.2	49.64	.26	11.4	3.0
35.9	51.00		53.2		48.30		26.4		17.93		50.6		11.83		3.7		49.90		8.4	

FIXED STARS, 1909.

(CONSTANTS OF STRUVE AND PETERS.)

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	δ Scorpii.				β^1 Scorpii.				ϕ Herculis.				Groombridge 2320.				δ^1 Apodis.			
	Right Ascension.		Declination *South.*		Right Ascension.		Declination *South.*		Right Ascension.		Declination *North.*		Right Ascension.		Declination *North.*		Right Ascension.		Declination *South.*	
	h m 15 54		° ′ −22 21		h m 16 0		° ′ −19 33		h m 16 5		° ′ +45 10		h m 16 6		° ′ +68 2		h m 16 6		° ′ −78 27	
	s		″		s		″		s		″		s		″		s		″	
Jan. 0.9	54.71	.30	41.0	1.0	6.31	.29	18.9	1.0	52.02	.30	16.2	3.2	1.37	.45	49.6	3.2	34.62	1.08	49.4	1.5
10.9	55.01	.33	42.0	1.1	6.60	.32	19.9	1.2	52.32	.33	13.0	2.7	1.82	.52	46.4	2.7	35.70	1.20	47.9	1.1
20.8	55.34	.34	43.1	1.1	6.92	.33	21.1	1.2	52.65	.37	10.3	2.3	2.34	.59	43.7	2.2	36.90	1.28	46.8	0.5
30.8	55.68	.34	44.2	1.3	7.25	.33	22.3	1.2	53.02	.38	8.0	1.8	2.93	.63	41.5	1.6	38.18	1.32	46.3	0.1
Feb. 9.8	56.02	.33	45.5	1.2	7.58	.33	23.5	1.2	53.40	.38	6.2	1.2	3.56	.64	39.9	1.0	39.50	1.35	46.2	0.4
19.8	56.35	.33	46.7	1.1	7.91	.32	24.7	1.1	53.78	.38	5.0	0.5	4.20	.65	38.9	0.2	40.85	1.32	46.6	0.9
Mar. 1.7	56.68	.31	47.8	1.1	8.23	.31	25.8	1.1	54.16	.37	4.5	0.1	4.85	.63	38.7	0.4	42.17	1.29	47.5	1.4
11.7	56.99	.29	48.9	1.0	8.54	.29	26.9	0.9	54.53	.34	4.6	0.7	5.48	.58	39.1	1.1	43.46	1.23	48.9	1.7
21.7	57.28	.27	49.9	0.9	8.83	.27	27.8	0.8	54.87	.32	5.3	1.3	6.06	.52	40.2	1.6	44.69	1.13	50.6	2.2
31.6	57.55	.25	50.8	0.8	9.10	.25	28.6	0.6	55.19	.28	6.6	1.8	6.58	.46	41.8	2.2	45.82	1.03	52.8	2.4
Apr. 10.6	57.80	.22	51.6	0.7	9.35	.22	29.2	0.5	55.47	.24	8.4	2.1	7.04	.37	44.0	2.6	46.85	0.91	55.2	2.7
20.6	58.02	.19	52.3	0.6	9.57	.20	29.7	0.5	55.71	.19	10.5	2.5	7.41	.28	46.6	2.9	47.76	0.77	57.9	2.9
30.6	58.21	.17	52.9	0.5	9.77	.16	30.2	0.3	55.90	.15	13.0	2.8	7.69	.19	49.5	3.0	48.53	0.62	60.8	3.0
May 10.5	58.38	.14	53.4	0.5	9.93	.14	30.5	0.3	56.05	.10	15.8	2.8	7.88	.09	52.5	3.2	49.15	0.46	63.8	3.1
20.5	58.52	.10	53.9	0.4	10.07	.11	30.8	0.2	56.15	.06	18.6	2.9	7.97	.01	55.7	3.2	49.61	0.29	66.9	3.2
30.5	58.62	.07	54.3	0.3	10.18	.07	31.0	0.1	56.21	.01	21.5	2.8	7.96	.10	58.9	3.0	49.90	0.12	70.1	3.1
June 9.5	58.69	.03	54.6	0.2	10.25	.04	31.1	0.1	56.22	.04	24.3	2.6	7.86	.20	61.9	2.8	50.02	0.07	73.2	2.9
19.4	58.72	.00	54.8	0.2	10.29	.00	31.2	0.0	56.18	.08	26.9	2.4	7.66	.28	64.7	2.5	49.95	0.24	76.1	2.8
29.4	58.72	.03	55.0	0.1	10.29	.03	31.2	0.0	56.10	.13	29.3	2.1	7.38	.35	67.2	2.2	49.71	0.41	78.9	2.5
July 9.4	58.69	.07	55.1	0.1	10.26	.06	31.2	0.0	55.97	.17	31.4	1.7	7.03	.42	69.4	1.8	49.30	0.56	81.4	2.1
19.3	58.62	.10	55.2	0.0	10.20	.10	31.2	0.1	55.80	.20	33.1	1.4	6.61	.48	71.2	1.3	48.74	0.70	83.5	1.8
29.3	58.52	.13	55.2	0.1	10.10	.12	31.1	0.1	55.60	.23	34.5	0.9	6.13	.53	72.5	0.8	48.04	0.81	85.3	1.3
Aug. 8.3	58.39	.15	55.1	0.2	9.98	.14	31.0	0.2	55.37	.25	35.4	0.5	5.60	.56	73.3	0.3	47.23	0.89	86.6	0.8
18.3	58.24	.16	54.9	0.3	9.84	.16	30.8	0.2	55.12	.26	35.9	0.0	5.04	.57	73.6	0.2	46.34	0.95	87.4	0.3
28.2	58.08	.17	54.6	0.3	9.68	.16	30.6	0.3	54.86	.27	35.9	0.5	4.47	.58	73.4	0.8	45.39	0.96	87.7	0.3
Sept. 7.2	57.91	.16	54.3	0.3	9.52	.16	30.3	0.3	54.59	.27	35.4	0.9	3.89	.57	72.6	1.2	44.43	0.94	87.4	0.8
17.2	57.75	.14	54.0	0.5	9.36	.15	30.0	0.3	54.32	.25	34.5	1.4	3.32	.54	71.4	1.8	43.49	0.87	86.6	1.4
27.2	57.61	.12	53.5	0.4	9.21	.12	29.7	0.3	54.07	.22	33.1	1.8	2.78	.50	69.6	2.2	42.62	0.76	85.2	1.8
Oct. 7.1	57.49	.09	53.1	0.4	9.09	.10	29.4	0.3	53.85	.19	31.3	2.3	2.28	.43	67.4	2.7	41.86	0.61	83.4	2.1
17.1	57.40	.05	52.7	0.3	8.99	.05	29.1	0.1	53.66	.15	29.0	2.7	1.85	.36	64.7	3.0	41.25	0.44	81.3	2.5
27.1	57.35	.00	52.4	0.2	8.94	.00	29.0	0.1	53.51	.09	26.3	3.0	1.49	.26	61.7	3.4	40.81	0.24	78.8	2.8
Nov. 6.0	57.35	.05	52.2	0.0	8.94	.05	28.9	0.1	53.42	.03	23.3	3.2	1.23	.17	58.3	3.7	40.57	0.02	76.0	2.8
16.0	57.40	.11	52.2	0.1	8.99	.10	29.0	0.3	53.39	.03	20.1	3.5	1.06	.05	54.6	3.8	40.55	0.21	73.2	2.8
26.0	57.51	.17	52.3	0.3	9.09	.15	29.3	0.4	53.42	.10	16.6	3.6	1.01	.06	50.8	3.9	40.76	0.43	70.4	2.7
Dec. 6.0	57.68	.21	52.6	0.5	9.24	.21	29.7	0.7	53.52	.16	13.0	3.6	1.07	.18	46.9	3.8	41.19	0.64	67.7	2.5
15.9	57.89	.25	53.1	0.7	9.45	.24	30.4	0.8	53.68	.22	9.4	3.6	1.25	.28	43.1	3.7	41.83	0.83	65.2	2.2
25.9	58.14	.29	53.8	0.9	9.69	.28	31.2	1.0	53.90	.27	5.8	3.3	1.53	.39	39.4	3.4	42.66	1.00	63.0	1.7
35.9	58.43		54.7		9.97		32.2		54.17		2.5		1.92		36.0		43.66		61.3	

(CONSTANTS OF STRUVE AND PETERS.)

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	δ Ophiuchi.				σ Coronæ Borealis.				τ Herculis.				γ Apodis.				η Ursæ Minoris.			
	Right Ascension.		Declination South.		Right Ascension.		Declination North.		Right Ascension.		Declination North.		Right Ascension.		Declination South.		Right Ascension.		Declination North.	
	h m 16 9		° ′ − 3 27		h m 16 11		° ′ +34 5		h m 16 16		° ′ +46 31		h m 16 19		° ′ −78 41		h m 16 20		° ′ +75 57	
	s		″		s		″		s		″		s		″		s		″	
Jan. 0.9	32.40	.27	35.9	1.7	14.17	.27	14.7	3.0	58.14	.29	39.7	3.2	19.11	1.06	25.4	1.7	5.10	.57	46.1	3.2
10.9	32.67	.29	37.6	1.7	14.44	.30	11.7	2.6	58.43	.33	36.5	2.8	20.17	1.19	23.7	1.2	5.67	.71	42.9	2.8
20.9	32.96	.31	39.3	1.6	14.74	.33	9.1	2.3	58.76	.36	33.7	2.4	21.36	1.28	22.5	0.7	6.38	.81	40.1	2.3
30.8	33.27	.31	40.9	1.5	15.07	.34	6.8	1.8	59.12	.38	31.3	1.9	22.64	1.34	21.8	0.3	7.19	.89	37.8	1.6
Feb. 9.8	33.58	.31	42.4	1.2	15.41	.34	5.0	1.3	59.50	.39	29.4	1.2	23.98	1.37	21.5	0.2	8.08	.94	36.2	1.1
19.8	33.89	.30	43.6	1.0	15.75	.34	3.7	0.7	59.89	.39	28.2	0.6	25.35	1.37	21.7	0.7	9.02	.96	35.1	0.3
Mar. 1.7	34.19	.29	44.6	0.8	16.09	.32	3.0	0.1	60.28	.37	27.6	0.0	26.72	1.33	22.4	1.1	9.98	.93	34.8	0.3
11.7	34.48	.28	45.4	0.4	16.41	.31	2.9	0.4	60.65	.36	27.6	0.6	28.05	1.28	23.5	1.6	10.91	.88	35.1	1.0
21.7	34.76	.26	45.8	0.2	16.72	.28	3.3	1.0	61.01	.33	28.2	1.2	29.33	1.20	25.1	1.9	11.79	.80	36.1	1.6
31.7	35.02	.24	46.0	0.0	17.00	.25	4.3	1.4	61.34	.29	29.4	1.7	30.53	1.09	27.0	2.3	12.59	.70	37.7	2.1
Apr. 10.6	35.26	.21	46.0	0.3	17.25	.22	5.7	1.9	61.63	.25	31.1	2.2	31.62	0.98	29.3	2.5	13.29	.57	39.8	2.5
20.6	35.47	.19	45.7	0.5	17.47	.19	7.6	2.1	61.88	.21	33.3	2.5	32.60	0.84	31.8	2.8	13.86	.44	42.3	2.8
30.6	35.66	.16	45.2	0.6	17.66	.15	9.7	2.4	62.09	.17	35.8	2.7	33.44	0.69	34.6	3.0	14.30	.28	45.1	3.1
May 10.5	35.82	.13	44.6	0.7	17.81	.12	12.1	2.5	62.26	.12	38.5	2.9	34.13	0.53	37.6	3.1	14.58	.13	48.2	3.1
20.5	35.95	.11	43.9	0.8	17.93	.07	14.6	2.5	62.38	.07	41.4	2.9	34.66	0.36	40.7	3.1	14.71	.02	51.3	3.2
30.5	36.06	.07	43.1	0.8	18.00	.04	17.1	2.5	62.45	.01	44.3	2.9	35.02	0.18	43.8	3.0	14.69	.18	54.5	3.1
June 9.5	36.13	.04	42.3	0.8	18.04	.00	19.6	2.4	62.46	.03	47.2	2.7	35.20	0.01	46.8	3.0	14.51	.32	57.6	2.8
19.4	36.17	.00	41.5	0.7	18.04	.05	22.0	2.2	62.43	.08	49.9	2.5	35.19	0.19	49.8	2.8	14.19	.45	60.4	2.6
29.4	36.17	.02	40.8	0.7	17.99	.08	24.2	2.0	62.35	.12	52.4	2.2	35.00	0.36	52.6	2.6	13.74	.58	63.0	2.3
July 9.4	36.15	.06	40.1	0.6	17.91	.12	26.2	1.7	62.23	.16	54.6	1.9	34.64	0.53	55.2	2.3	13.16	.69	65.3	1.9
19.4	36.09	.09	39.5	0.6	17.79	.15	27.9	1.3	62.07	.21	56.5	1.5	34.11	0.68	57.5	1.9	12.47	.78	67.2	1.4
29.3	36.00	.11	38.9	0.4	17.64	.17	29.2	0.9	61.86	.23	58.0	1.1	33.43	0.80	59.4	1.4	11.69	.85	68.6	0.9
Aug. 8.3	35.89	.14	38.5	0.4	17.47	.20	30.1	0.6	61.63	.26	59.1	0.6	32.63	0.90	60.8	1.0	10.84	.91	69.5	0.4
18.3	35.75	.15	38.1	0.2	17.27	.21	30.7	0.1	61.37	.27	59.7	0.1	31.73	0.96	61.8	0.4	9.93	.94	69.9	0.1
28.3	35.60	.16	37.9	0.2	17.06	.22	30.8	0.3	61.10	.29	59.8	0.3	30.77	0.98	62.2	0.1	8.99	.95	69.8	0.6
Sept. 7.2	35.44	.15	37.7	0.0	16.84	.22	30.5	0.7	60.81	.28	59.5	0.9	29.79	0.97	62.1	0.6	8.04	.93	69.2	1.1
17.2	35.29	.15	37.7	0.2	16.62	.20	29.8	1.1	60.53	.27	58.6	1.3	28.82	0.91	61.5	1.2	7.11	.90	68.1	1.6
27.2	35.14	.12	37.9	0.3	16.42	.19	28.7	1.5	60.26	.24	57.3	1.7	27.91	0.81	60.3	1.6	6.21	.84	66.5	2.1
Oct. 7.1	35.02	.10	38.2	0.5	16.23	.15	27.2	1.9	60.02	.21	55.6	2.2	27.10	0.68	58.7	2.1	5.37	.75	64.4	2.5
17.1	34.92	.06	38.7	0.6	16.08	.11	25.3	2.3	59.81	.16	53.4	2.6	26.42	0.50	56.6	2.4	4.62	.65	61.9	2.9
27.1	34.86	.02	39.3	0.9	15.97	.07	23.0	2.6	59.65	.11	50.8	3.0	25.92	0.30	54.2	2.7	3.97	.51	59.0	3.3
Nov. 6.1	34.84	.03	40.2	1.0	15.90	.01	20.4	2.9	59.54	.05	47.8	3.2	25.62	0.08	51.5	2.8	3.46	.37	55.7	3.6
16.0	34.87	.09	41.2	1.3	15.89	.04	17.5	3.1	59.49	.01	44.6	3.5	25.54	0.15	48.7	2.8	3.09	.21	52.1	3.7
26.0	34.96	.13	42.5	1.4	15.93	.10	14.4	3.2	59.50	.08	41.1	3.6	25.69	0.38	45.9	2.8	2.88	.03	48.4	3.8
Dec. 6.0	35.09	.17	43.9	1.6	16.03	.16	11.2	3.4	59.58	.14	37.5	3.7	26.07	0.60	43.1	2.6	2.85	.14	44.6	3.8
15.9	35.26	.22	45.5	1.7	16.19	.20	7.8	3.3	59.72	.21	33.8	3.5	26.67	0.79	40.5	2.3	2.99	.31	40.8	3.7
25.9	35.48	.26	47.2	1.7	16.39	.25	4.5	3.1	59.93	.26	30.3	3.4	27.46	0.98	38.2	1.9	3.30	.47	37.1	3.4
35.9	35.74		48.9		16.64		1.4		60.19		26.9		28.44		36.3		3.77		33.7	

(CONSTANTS OF STRUVE AND PETERS.)

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	η Draconis.				α Scorpii. (*Antares.*)				β Herculis.				A Draconis.				ζ Ophiuchi.			
	Right Ascension.		Declination *North.*		Right Ascension.		Declination *South.*		Right Ascension.		Declination *North.*		Right Ascension.		Declination *North.*		Right Ascension.		Declination *South.*	
	h m 16 22		° ′ +61 42		h m 16 23		° ′ −26 13		h m 16 26		° ′ +21 40		h m 16 28		° ′ +68 57		h m 16 32		° ′ −10 22	
	s		″		s		″		s		″		s		″		s		″	
Jan. 0.9	42.80	.35	63.6	3.3	47.05	.29	44.3	0.6	16.33	.25	71.1	2.7	6.24	.41	45.5	3.3	6.52	.26	57.4	1.3
10.9	43.15	.41	60.3	3.0	47.34	.32	44.9	0.7	16.58	.28	68.4	2.4	6.65	.50	42.2	2.9	6.78	.29	58.7	1.4
20.9	43.56	.47	57.3	2.4	47.66	.34	45.6	0.9	16.86	.30	66.0	2.2	7.15	.57	39.3	2.5	7.07	.30	60.1	1.3
30.8	44.03	.50	54.9	1.9	48.00	.34	46.5	0.9	17.16	.31	63.8	1.8	7.72	.63	36.8	1.8	7.37	.31	61.4	1.3
Feb. 9.8	44.53	.52	53.0	1.2	48.34	.35	47.4	1.0	17.47	.32	62.0	1.3	8.35	.65	35.0	1.2	7.68	.31	62.7	1.1
19.8	45.05	.53	51.8	0.5	48.69	.34	48.4	0.9	17.79	.31	60.7	0.9	9.00	.67	33.8	0.5	7.99	.31	63.8	0.9
Mar. 1.8	45.58	.51	51.3	0.2	49.03	.33	49.3	0.9	18.10	.30	59.8	0.4	9.67	.66	33.3	0.1	8.30	.31	64.7	0.7
11.7	46.09	.49	51.5	0.8	49.36	.31	50.2	0.9	18.40	.29	59.4	0.1	10.33	.62	33.4	0.8	8.61	.29	65.4	0.6
21.7	46.58	.45	52.3	1.4	49.67	.30	51.1	0.9	18.69	.27	59.5	0.5	10.95	.57	34.2	1.4	8.90	.27	66.0	0.3
31.7	47.03	.39	53.7	1.9	49.97	.28	52.0	0.8	18.96	.25	60.0	1.0	11.52	.51	35.6	2.0	9.17	.26	66.3	0.2
Apr. 10.6	47.42	.34	55.6	2.4	50.25	.25	52.8	0.7	19.21	.23	61.0	1.4	12.03	.43	37.6	2.4	9.43	.24	66.5	0.1
20.6	47.76	.27	58.0	2.8	50.50	.23	53.5	0.6	19.44	.19	62.4	1.7	12.46	.34	40.0	2.8	9.67	.21	66.4	0.2
30.6	48.03	.20	60.8	3.0	50.73	.20	54.1	0.6	19.63	.17	64.1	1.9	12.80	.24	42.8	3.0	9.88	.19	66.2	0.3
May 10.6	48.23	.12	63.8	3.1	50.93	.17	54.7	0.6	19.80	.14	66.0	2.0	13.04	.14	45.8	3.2	10.07	.16	65.9	0.4
20.5	48.35	.05	66.9	3.2	51.10	.14	55.3	0.5	19.94	.10	68.0	2.1	13.18	.04	49.0	3.2	10.23	.13	65.5	0.4
30.5	48.40	.02	70.1	3.1	51.24	.10	55.8	0.5	20.04	.06	70.1	2.1	13.22	.06	52.2	3.1	10.36	.10	65.1	0.5
June 9.5	48.38	.10	73.2	2.9	51.34	.06	56.3	0.4	20.10	.03	72.2	2.0	13.16	.16	55.3	3.0	10.46	.06	64.6	0.4
19.5	48.28	.17	76.1	2.7	51.40	.03	56.7	0.4	20.13	.00	74.2	1.9	13.00	.25	58.3	2.7	10.52	.03	64.2	0.5
29.4	48.11	.23	78.8	2.4	51.43	.01	57.1	0.4	20.13	.04	76.1	1.7	12.75	.34	61.0	2.4	10.55	.01	63.7	0.4
July 9.4	47.88	.29	81.2	2.0	51.42	.06	57.5	0.3	20.09	.08	77.8	1.5	12.41	.41	63.4	2.0	10.54	.04	63.3	0.4
19.4	47.59	.35	83.2	1.5	51.36	.09	57.8	0.2	20.01	.11	79.3	1.3	12.00	.48	65.4	1.6	10.50	.08	62.9	0.4
29.3	47.24	.38	84.7	1.1	51.27	.12	58.0	0.1	19.90	.14	80.6	0.9	11.52	.54	67.0	1.1	10.42	.10	62.5	0.3
Aug. 8.3	46.86	.42	85.8	0.6	51.15	.14	58.1	0.0	19.76	.16	81.5	0.7	10.98	.58	68.1	0.7	10.32	.13	62.2	0.2
18.3	46.44	.44	86.4	0.1	51.01	.17	58.1	0.1	19.60	.17	82.2	0.3	10.40	.61	68.8	0.1	10.19	.15	62.0	0.2
28.3	46.00	.45	86.5	0.4	50.84	.17	58.0	0.2	19.43	.19	82.5	0.0	9.79	.62	68.9	0.5	10.04	.16	61.8	0.2
Sept. 7.2	45.55	.45	86.1	1.0	50.67	.18	57.8	0.3	19.24	.19	82.5	0.4	9.17	.62	68.4	0.9	9.88	.16	61.6	0.1
17.2	45.10	.43	85.1	1.5	50.49	.17	57.5	0.4	19.05	.18	82.1	0.7	8.55	.60	67.5	1.5	9.72	.16	61.5	0.0
27.2	44.67	.40	83.6	1.9	50.32	.14	57.1	0.5	18.87	.16	81.4	1.1	7.95	.55	66.0	1.9	9.56	.14	61.5	0.1
Oct. 7.2	44.27	.35	81.7	2.4	50.18	.11	56.6	0.4	18.71	.13	80.3	1.4	7.40	.50	64.1	2.4	9.42	.11	61.6	0.1
17.1	43.92	.29	79.3	2.8	50.07	.08	56.2	0.5	18.58	.10	78.9	1.7	6.90	.43	61.7	2.8	9.31	.07	61.7	0.3
27.1	43.63	.22	76.5	3.2	49.99	.03	55.7	0.4	18.48	.05	77.2	2.1	6.47	.34	58.9	3.2	9.24	.03	62.0	0.5
Nov. 6.1	43.41	.14	73.3	3.5	49.96	.03	55.3	0.3	18.43	.01	75.1	2.3	6.13	.23	55.7	3.5	9.21	.01	62.5	0.6
16.0	43.27	.05	69.8	3.7	49.99	.08	55.0	0.2	18.42	.04	72.8	2.5	5.90	.13	52.2	3.7	9.22	.06	63.1	0.8
26.0	43.22	.03	66.1	3.8	50.07	.14	54.8	0.0	18.46	.09	70.3	2.7	5.77	.01	48.5	3.9	9.28	.11	63.9	0.9
Dec. 6.0	43.25	.13	62.3	3.9	50.21	.19	54.8	0.1	18.55	.15	67.6	2.8	5.76	.12	44.6	3.8	9.39	.17	64.8	1.1
16.0	43.38	.22	58.4	3.7	50.40	.23	54.9	0.3	18.70	.19	64.8	2.9	5.88	.23	40.8	3.8	9.56	.21	65.9	1.2
25.9	43.60	.31	54.7	3.5	50.63	.28	55.2	0.5	18.89	.23	61.9	2.8	6.11	.34	37.0	3.5	9.77	.24	67.1	1.3
35.9	43.91		51.2		50.91		55.7		19.12		59.1		6.45		33.5		10.01		68.4	

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	*α* Triang. Australis.				*η* Herculis.				*κ* Ophiuchi.				*ε* Ursæ Minoris.				*d* Herculis.			
	Right Ascension.		Declination *South.*		Right Ascension.		Declination *North.*		Right Ascension.		Declination *North.*		Right Ascension.		Declination *North.*		Right Ascension.		Declination *North.*	
	h m 16 38		° ′ −68 51		h m 16 39		° ′ +39 5		h m 16 53		° ′ + 9 30		h m 16 55		° ′ +82 10		h m 16 58		° ′ +33 41	
	s		″		s		″		s		″		s		″		s		″	
Jan. 0.9	55.81	.59	31.0	1.6	44.34	.25	35.8	3.2	19.43	.23	55.9	2.2	8.73	0.70	70.2	3.3	12.51	.23	53.5	3.1
10.9	56.40	.66	29.4	1.2	44.59	.29	32.6	2.9	19.66	.25	53.7	2.1	9.43	0.97	66.9	3.0	12.74	.26	50.4	2.8
20.9	57.06	.72	28.2	0.8	44.88	.32	29.7	2.5	19.91	.28	51.6	1.9	10.40	1.21	63.9	2.6	13.00	.30	47.6	2.5
30.8	57.78	.76	27.4	0.3	45.20	.34	27.2	2.0	20.19	.30	49.7	1.6	11.61	1.40	61.3	2.0	13.30	.31	45.1	2.1
Feb. 9.8	58.54	.77	27.1	0.0	45.54	.35	25.2	1.5	20.49	.30	48.1	1.4	13.01	1.53	59.3	1.4	13.61	.33	43.0	1.6
19.8	59.31	.78	27.1	0.5	45.89	.36	23.7	0.9	20.79	.30	46.7	0.9	14.54	1.61	57.9	0.8	13.94	.33	41.4	1.0
Mar. 1.8	60.09	.77	27.6	0.9	46.25	.34	22.8	0.2	21.09	.29	45.8	0.6	16.15	1.63	57.1	0.1	14.27	.33	40.4	0.5
11.7	60.86	.74	28.5	1.2	46.59	.33	22.6	0.3	21.38	.29	45.2	0.2	17.78	1.59	57.0	0.5	14.60	.32	39.9	0.1
21.7	61.60	.70	29.7	1.5	46.92	.32	22.9	0.9	21.67	.28	45.0	0.2	19.37	1.48	57.5	1.2	14.92	.31	40.0	0.7
31.7	62.30	.66	31.2	1.9	47.24	.29	23.8	1.4	21.95	.26	45.2	0.6	20.85	1.33	58.7	1.7	15.23	.28	40.7	1.2
Apr. 10.7	62.96	.60	33.1	2.1	47.53	.25	25.2	1.9	22.21	.23	45.8	0.9	22.18	1.14	60.4	2.2	15.51	.26	41.9	1.6
20.6	63.56	.54	35.2	2.3	47.78	.23	27.1	2.2	22.44	.22	46.7	1.1	23.32	0.90	62.6	2.6	15.77	.24	43.5	2.0
30.6	64.10	.46	37.5	2.5	48.01	.18	29.3	2.5	22.66	.19	47.8	1.4	24.22	0.65	65.2	2.9	16.01	.20	45.5	2.4
May 10.6	64.56	.37	40.0	2.6	48.19	.15	31.8	2.7	22.85	.17	49.2	1.5	24.87	0.38	68.1	3.0	16.21	.16	47.9	2.5
20.5	64.93	.29	42.6	2.7	48.34	.10	34.5	2.8	23.02	.13	50.7	1.6	25.25	0.10	71.1	3.2	16.37	.13	50.4	2.6
30.5	65.22	.19	45.3	2.7	48.44	.06	37.3	2.7	23.15	.10	52.3	1.6	25.35	0.19	74.3	3.1	16.50	.08	53.0	2.6
June 9.5	65.41	.10	48.0	2.6	48.50	.01	40.0	2.7	23.25	.07	53.9	1.6	25.16	0.46	77.4	3.0	16.58	.05	55.6	2.6
19.5	65.51	.01	50.6	2.5	48.51	.03	42.7	2.5	23.32	.03	55.5	1.5	24.70	0.72	80.4	2.8	16.63	.00	58.2	2.5
29.5	65.50	.11	53.1	2.4	48.48	.07	45.2	2.3	23.35	.00	57.0	1.4	23.98	0.96	83.2	2.5	16.63	.05	60.7	2.3
July 9.4	65.39	.20	55.5	2.1	48.41	.12	47.5	1.9	23.35	.04	58.4	1.2	23.02	1.17	85.7	2.2	16.58	.08	63.0	2.0
19.4	65.19	.30	57.6	1.8	48.29	.15	49.4	1.7	23.31	.08	59.6	1.1	21.85	1.36	87.9	1.8	16.50	.12	65.0	1.7
29.4	64.89	.37	59.4	1.4	48.14	.18	51.1	1.2	23.23	.11	60.7	0.9	20.49	1.52	89.7	1.3	16.38	.15	66.7	1.4
Aug. 8.3	64.52	.43	60.8	1.0	47.96	.22	52.3	0.9	23.12	.13	61.6	0.6	18.97	1.65	91.0	0.9	16.23	.19	68.1	1.0
18.3	64.09	.48	61.8	0.6	47.74	.23	53.2	0.4	22.99	.15	62.2	0.4	17.32	1.74	91.9	0.4	16.04	.21	69.1	0.6
28.3	63.61	.50	62.4	0.0	47.51	.24	53.6	0.0	22.84	.17	62.6	0.2	15.58	1.78	92.3	0.1	15.83	.22	69.7	0.2
Sept. 7.2	63.11	.51	62.4	0.4	47.27	.25	53.6	0.5	22.67	.18	62.8	0.1	13.80	1.79	92.2	0.6	15.61	.23	69.9	0.2
17.2	62.60	.49	62.0	0.9	47.02	.24	53.1	0.9	22.49	.17	62.7	0.3	12.01	1.76	91.6	1.2	15.38	.22	69.7	0.7
27.2	62.11	.44	61.1	1.3	46.78	.22	52.2	1.4	22.32	.16	62.4	0.6	10.25	1.68	90.4	1.6	15.16	.21	69.0	1.1
Oct. 7.2	61.67	.37	59.8	1.7	46.56	.20	50.8	1.8	22.16	.13	61.8	0.9	8.57	1.57	88.8	2.0	14.95	.19	67.9	1.5
17.1	61.30	.28	58.1	2.0	46.36	.15	49.0	2.2	22.03	.10	60.9	1.1	7.00	1.41	86.8	2.5	14.76	.16	66.4	1.9
27.1	61.02	.18	56.1	2.3	46.21	.11	46.8	2.6	21.93	.07	59.8	1.4	5.59	1.21	84.3	2.9	14.60	.11	64.5	2.3
Nov. 6.1	60.84	.05	53.8	2.4	46.10	.06	44.2	2.9	21.86	.02	58.4	1.6	4.38	0.97	81.4	3.2	14.49	.06	62.2	2.6
16.1	60.79	.07	51.4	2.5	46.04	.00	41.3	3.2	21.84	.03	56.8	1.8	3.41	0.71	78.2	3.5	14.43	.01	59.6	2.9
26.0	60.86	.20	48.9	2.4	46.04	.06	38.1	3.3	21.87	.08	55.0	2.0	2.70	0.41	74.7	3.6	14.42	.04	56.7	3.1
Dec. 6.0	61.06	.32	46.5	2.3	46.10	.11	34.8	3.5	21.95	.12	53.0	2.2	2.29	0.11	71.1	3.7	14.46	.10	53.6	3.2
16.0	61.38	.44	44.2	2.1	46.21	.18	31.3	3.4	22.07	.17	50.8	2.2	2.18	0.20	67.4	3.6	14.56	.15	50.4	3.3
25.9	61.82	.54	42.1	1.8	46.39	.22	27.9	3.3	22.24	.21	48.6	2.3	2.38	0.51	63.8	3.5	14.71	.20	47.1	3.1
35.9	62.36		40.3		46.61		24.6		22.45		46.3		2.89		60.3		14.91		44.0	

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	η Ophiuchi.				α¹ Herculis.				π Herculis.				θ Ophiuchi.				*b* Ophiuchi.			
	Right Ascension.		Declination *South*.		Right Ascension.		Declination *North*.		Right Ascension.		Declination *North*.		Right Ascension.		Declination *South*.		Right Ascension.		Declination *South*.	
	h m 17 5		° ′ −15 36		h m 17 10		° ′ +14 29		h m 17 11		° ′ +36 54		h m 17 16		° ′ −24 54		h m 17 20		° ′ −24 5	
	s		″		s		″		s		″		s		″		s		″	
Jan. 0.9	7.02	.24	44.2	0.9	27.65	.21	34.1	2.4	50.34	.21	35.8	3.2	22.55	.24	31.1	0.4	46.05	.24	30.3	0.3
10.9	7.26	.27	45.1	0.9	27.86	.24	31.7	2.2	50.55	.26	32.6	3.0	22.79	.28	31.5	0.4	46.29	.27	30.6	0.5
20.9	7.53	.29	46.0	1.0	28.10	.27	29.5	2.1	50.81	.29	29.6	2.6	23.07	.30	31.9	0.5	46.56	.30	31.1	0.5
30.9	7.82	.31	47.0	0.9	28.37	.29	27.4	1.8	51.10	.31	27.0	2.2	23.37	.32	32.4	0.5	46.86	.32	31.6	0.5
Feb. 9.8	8.13	.31	47.9	0.9	28.66	.30	25.6	1.4	51.41	.33	24.8	1.7	23.69	.33	32.9	0.6	47.18	.32	32.1	0.5
19.8	8.44	.32	48.8	0.7	28.96	.30	24.2	1.0	51.74	.34	23.1	1.2	24.02	.34	33.5	0.5	47.50	.33	32.6	0.6
Mar. 1.8	8.76	.31	49.5	0.6	29.26	.30	23.2	0.6	52.08	.34	21.9	0.5	24.36	.33	34.0	0.6	47.83	.33	33.2	0.5
11.8	9.07	.31	50.1	0.5	29.56	.29	22.6	0.1	52.42	.33	21.4	0.0	24.69	.33	34.6	0.4	48.16	.33	33.7	0.4
21.7	9.38	.30	50.6	0.3	29.85	.28	22.5	0.3	52.75	.32	21.4	0.7	25.02	.32	35.0	0.4	48.49	.32	34.1	0.3
31.7	9.68	.28	50.9	0.1	30.13	.27	22.8	0.7	53.07	.30	22.1	1.2	25.34	.31	35.4	0.4	48.81	.31	34.4	0.3
Apr. 10.7	9.96	.26	51.0	0.0	30.40	.25	23.5	1.0	53.37	.28	23.3	1.6	25.65	.29	35.8	0.3	49.12	.29	34.7	0.3
20.6	10.22	.25	51.0	0.1	30.65	.23	24.5	1.4	53.65	.25	24.9	2.0	25.94	.27	36.1	0.2	49.41	.27	35.0	0.2
30.6	10.47	.22	50.9	0.1	30.88	.21	25.9	1.6	53.90	.21	26.9	2.4	26.21	.24	36.3	0.3	49.68	.25	35.2	0.2
May 10.6	10.69	.20	50.8	0.2	31.09	.18	27.5	1.7	54.11	.18	29.3	2.6	26.45	.22	36.6	0.2	49.93	.22	35.4	0.1
20.6	10.89	.17	50.6	0.3	31.27	.15	29.2	1.9	54.29	.14	31.9	2.8	26.67	.19	36.8	0.3	50.15	.19	35.5	0.2
30.5	11.06	.13	50.3	0.2	31.42	.11	31.1	1.9	54.43	.10	34.7	2.8	26.86	.15	37.1	0.2	50.34	.16	35.7	0.2
June 9.5	11.19	.10	50.1	0.3	31.53	.08	33.0	1.9	54.53	.05	37.5	2.7	27.01	.12	37.3	0.3	50.50	.12	35.9	0.2
19.5	11.29	.06	49.8	0.2	31.61	.04	34.9	1.8	54.58	.01	40.2	2.6	27.13	.08	37.6	0.2	50.62	.08	36.1	0.2
29.5	11.35	.02	49.6	0.2	31.65	.00	36.7	1.7	54.59	.04	42.8	2.5	27.21	.03	37.8	0.3	50.70	.04	36.3	0.3
July 9.4	11.37	.02	49.4	0.2	31.65	.03	38.4	1.5	54.55	.08	45.3	2.2	27.24	.01	38.1	0.3	50.74	.01	36.6	0.2
19.4	11.35	.05	49.2	0.1	31.62	.07	39.9	1.3	54.47	.12	47.5	1.9	27.23	.05	38.4	0.3	50.73	.05	36.8	0.3
29.4	11.30	.09	49.1	0.2	31.55	.11	41.2	1.1	54.35	.16	49.4	1.5	27.18	.09	38.7	0.2	50.68	.08	37.1	0.2
Aug. 8.3	11.21	.12	48.9	0.1	31.44	.13	42.3	0.8	54.19	.19	50.9	1.2	27.09	.12	38.9	0.2	50.60	.12	37.3	0.2
18.3	11.09	.15	48.8	0.1	31.31	.16	43.1	0.5	54.00	.22	52.1	0.7	26.97	.15	39.1	0.1	50.48	.15	37.5	0.1
28.3	10.94	.16	48.7	0.1	31.15	.17	43.6	0.3	53.78	.24	52.8	0.4	26.82	.17	39.2	0.1	50.33	.17	37.6	0.1
Sept. 7.3	10.78	.17	48.6	0.0	30.98	.18	43.9	0.1	53.54	.24	53.2	0.1	26.65	.18	39.3	0.0	50.16	.18	37.7	0.0
17.2	10.61	.17	48.6	0.1	30.80	.18	43.8	0.3	53.30	.24	53.1	0.6	26.47	.18	39.3	0.2	49.98	.17	37.7	0.1
27.2	10.44	.16	48.5	0.0	30.62	.17	43.5	0.6	53.06	.23	52.5	1.0	26.29	.17	39.1	0.2	49.81	.17	37.6	0.2
Oct. 7.2	10.28	.13	48.5	0.0	30.45	.15	42.9	0.9	52.83	.21	51.5	1.4	26.12	.14	38.9	0.2	49.64	.15	37.4	0.2
17.2	10.15	.10	48.5	0.1	30.30	.12	42.0	1.3	52.62	.18	50.1	1.9	25.98	.12	38.7	0.3	49.49	.11	37.2	0.2
27.1	10.05	.06	48.6	0.2	30.18	.09	40.7	1.5	52.44	.13	48.2	2.3	25.86	.07	38.4	0.2	49.38	.08	37.0	0.2
Nov. 6.1	9.99	.01	48.8	0.2	30.09	.04	39.2	1.8	52.31	.09	45.9	2.6	25.79	.02	38.2	0.2	49.30	.03	36.8	0.2
16.1	9.98	.04	49.0	0.4	30.05	.01	37.4	2.0	52.22	.04	43.3	2.9	25.77	.02	38.0	0.2	49.27	.02	36.6	0.1
26.0	10.02	.08	49.4	0.5	30.06	.06	35.4	2.2	52.18	.02	40.4	3.1	25.79	.08	37.8	0.1	49.29	.08	36.5	0.1
Dec. 6.0	10.10	.14	49.9	0.6	30.12	.10	33.2	2.4	52.20	.08	37.3	3.3	25.87	.14	37.7	0.0	49.37	.13	36.4	0.1
16.0	10.24	.18	50.5	0.8	30.22	.15	30.8	2.4	52.28	.14	34.0	3.4	26.01	.18	37.7	0.2	49.50	.18	36.5	0.2
26.0	10.42	.22	51.3	0.9	30.37	.19	28.4	2.4	52.42	.18	30.6	3.3	26.19	.23	37.9	0.2	49.68	.22	36.7	0.3
35.9	10.64		52.2		30.56		26.0		52.60		27.3		26.42		38.1		49.90		37.0	

(CONSTANTS OF STRUVE AND PETERS.)

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	δ Aræ.				β Draconis.				α Ophiuchi.				ι Herculis.				ω Draconis.			
	Right Ascension.		Declination *South.*		Right Ascension.		Declination *North.*		Right Ascension.		Declination *North.*		Right Ascension.		Declination *North.*		Right Ascension.		Declination *North.*	
	h m 17 22		° ′ −60 36		h m 17 28		° ′ +52 21		h m 17 30		° ′ +12 37		h m 17 36		° ′ +46 2		h m 17 37		° ′ +68 47	
	s		″		s		″		s		″		s		″		s		″	
Jan. 1.0	48.38		26.7		19.99		61.1		40.34		30.0		51.33		71.2		25.47		54.9	
10.9	48.77	.39	25.1	1.6	20.20	.21	57.6	3.5	40.53	.19	27.7	2.3	51.52	.19	67.7	3.5	25.70	.23	51.3	3.6
20.9	49.23	.46	23.7	1.4	20.46	.26	54.3	3.3	40.76	.23	25.5	2.2	51.76	.24	64.5	3.2	26.04	.34	47.9	3.4
30.9	49.74	.51	22.7	1.0	20.78	.32	51.4	2.9	41.01	.25	23.5	2.0	52.04	.28	61.6	2.9	26.47	.43	44.9	3.0
Feb. 9.8	50.28	.54	21.9	0.8	21.13	.35	48.9	2.5	41.29	.28	21.8	1.7	52.36	.32	59.1	2.5	26.98	.51	42.3	2.6
19.8	50.85	.57	21.5	0.4	21.52	.39	47.0	1.9	41.58	.29	20.4	1.4	52.71	.35	57.2	1.9	27.56	.58	40.3	2.0
Mar. 1.8	51.43	.58	21.4	0.1	21.92	.40	45.7	1.3	41.87	.29	19.3	1.1	53.08	.37	55.8	1.4	28.18	.62	38.9	1.4
11.8	52.02	.59	21.6	0.2	22.34	.42	45.0	0.7	42.17	.30	18.7	0.6	53.45	.37	55.0	0.8	28.82	.64	38.2	0.7
21.7	52.60	.58	22.1	0.5	22.75	.41	45.0	0.0	42.46	.29	18.5	0.2	53.82	.37	54.9	0.1	29.47	.65	38.1	0.1
31.7	53.16	.56	23.0	0.9	23.15	.40	45.6	0.6	42.75	.29	18.7	0.2	54.18	.36	55.5	0.6	30.10	.63	38.7	0.6
Apr. 10.7	53.70	.54	24.1	1.1	23.53	.38	46.9	1.3	43.03	.28	19.3	0.6	54.53	.35	56.6	1.1	30.69	.59	40.0	1.3
20.7	54.22	.52	25.4	1.3	23.88	.35	48.7	1.8	43.29	.26	20.3	1.0	54.85	.32	58.2	1.6	31.23	.54	41.8	1.8
30.6	54.69	.47	27.0	1.6	24.19	.31	50.9	2.2	43.54	.25	21.6	1.3	55.15	.30	60.3	2.1	31.70	.47	44.1	2.3
May 10.6	55.12	.43	28.8	1.8	24.45	.26	53.6	2.7	43.76	.22	23.1	1.5	55.40	.25	62.8	2.5	32.09	.39	46.8	2.7
20.6	55.49	.37	30.7	1.9	24.67	.22	56.5	2.9	43.95	.19	24.8	1.7	55.62	.22	65.6	2.8	32.40	.31	49.8	3.0
30.5	55.81	.32	32.8	2.1	24.83	.16	59.6	3.1	44.12	.17	26.6	1.8	55.79	.17	68.6	3.0	32.61	.21	53.0	3.2
June 9.5	56.06	.25	35.0	2.2	24.93	.10	62.7	3.1	44.25	.13	28.5	1.9	55.91	.12	71.7	3.1	32.71	.10	56.3	3.3
19.5	56.24	.18	37.2	2.2	24.98	.05	65.9	3.2	44.35	.10	30.3	1.8	55.98	.07	74.7	3.0	32.72	.01	59.6	3.3
29.5	56.34	.10	39.4	2.2	24.96	.02	68.9	3.0	44.42	.07	32.1	1.8	55.99	.01	77.7	3.0	32.62	.10	62.8	3.2
July 9.4	56.36	.02	41.5	2.1	24.89	.07	71.8	2.9	44.44	.02	33.8	1.7	55.95	.04	80.5	2.8	32.42	.20	65.8	3.0
19.4	56.30	.06	43.5	2.0	24.76	.13	74.4	2.6	44.42	.02	35.3	1.5	55.86	.09	83.1	2.6	32.12	.30	68.5	2.7
29.4	56.17	.13	45.4	1.9	24.57	.19	76.6	2.2	44.37	.05	36.6	1.3	55.72	.14	85.3	2.2	31.74	.38	70.9	2.4
Aug. 8.4	55.97	.20	46.9	1.5	24.34	.23	78.5	1.9	44.28	.09	37.7	1.1	55.54	.18	87.2	1.9	31.28	.46	73.0	2.1
18.3	55.71	.26	48.2	1.3	24.06	.28	80.0	1.5	44.15	.13	38.6	0.9	55.31	.23	88.8	1.6	30.76	.52	74.6	1.6
28.3	55.40	.31	49.1	0.9	23.75	.31	81.0	1.0	44.00	.15	39.2	0.6	55.05	.26	89.9	1.1	30.18	.58	75.8	1.2
Sept. 7.3	55.06	.34	49.6	0.5	23.41	.34	81.6	0.6	43.84	.16	39.5	0.3	54.77	.28	90.5	0.6	29.56	.62	76.4	0.6
17.2	54.70	.36	49.7	0.1	23.06	.35	81.6	0.0	43.66	.18	39.6	0.1	54.47	.30	90.7	0.2	28.92	.64	76.6	0.2
27.2	54.34	.36	49.4	0.3	22.71	.35	81.1	0.5	43.48	.18	39.4	0.2	54.17	.30	90.3	0.4	28.28	.64	76.2	0.4
Oct. 7.2	53.99	.35	48.7	0.7	22.38	.33	80.1	1.0	43.31	.17	38.9	0.5	53.88	.29	89.5	0.8	27.65	.63	75.3	0.9
17.2	53.69	.30	47.6	1.1	22.06	.32	78.6	1.5	43.15	.16	38.1	0.8	53.61	.27	88.2	1.3	27.05	.60	73.8	1.5
27.1	53.44	.25	46.1	1.5	21.78	.28	76.7	1.9	43.02	.13	37.0	1.1	53.37	.24	86.4	1.8	26.50	.55	71.9	1.9
Nov. 6.1	53.26	.18	44.4	1.7	21.55	.23	74.3	2.4	42.92	.10	35.7	1.3	53.17	.20	84.2	2.2	26.01	.49	69.5	2.4
16.1	53.16	.10	42.4	2.0	21.37	.18	71.5	2.8	42.87	.05	34.1	1.6	53.02	.15	81.6	2.6	25.61	.40	66.7	2.8
26.1	53.15	.01	40.4	2.0	21.26	.11	68.3	3.2	42.86	.01	32.3	1.8	52.92	.10	78.6	3.0	25.31	.30	63.5	3.2
Dec. 6.0	53.24	.09	38.3	2.1	21.21	.05	64.9	3.4	42.90	.04	30.2	2.1	52.89	.03	75.3	3.3	25.11	.20	60.0	3.5
16.0	53.42	.18	36.2	2.1	21.23	.02	61.3	3.6	42.98	.08	28.0	2.2	52.92	.03	71.9	3.4	25.03	.08	56.3	3.7
26.0	53.69	.27	34.2	2.0	21.33	.10	57.6	3.7	43.11	.13	25.7	2.3	53.01	.09	68.3	3.6	25.07	.04	52.6	3.7
35.9	54.04	.35	32.4	1.8	21.50	.17	54.0	3.6	43.29	.18	23.4	2.3	53.17	.16	64.8	3.5	25.23	.16	48.9	3.7

(CONSTANTS OF STRUVE AND PETERS.)

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	μ Herculis.				ψ¹ Draconis.				θ Herculis.				γ Draconis.				γ² Sagittarii.			
	Right Ascension.		Declination *North.*		Right Ascension.		Declination *North.*		Right Ascension.		Declination *North.*		Right Ascension.		Declination *North.*		Right Ascension.		Declination *South.*	
	h m 17 42		° ′ +27 46		h m 17 43		° ′ +72 11		h m 17 53		° ′ +37 15		h m 17 54		° ′ +51 29		h m 17 59		° ′ −30 25	
	s		″		s		″		s		″		s		″		s		″	
Jan. 1.0	51.52	.18	20.8	3.0	29.30	.22	32.4	3.7	5.57	.16	39.8	3.3	26.98	.16	53.1	3.5	54.84	.21	33.0	0.2
10.9	51.70	.22	17.8	2.8	29.52	.36	28.7	3.4	5.73	.21	36.5	3.0	27.14	.22	49.6	3.4	55.05	.25	32.8	0.2
20.9	51.92	.24	15.0	2.5	29.88	.48	25.3	3.1	5.94	.25	33.5	2.8	27.36	.28	46.2	3.1	55.30	.29	32.6	0.0
30.9	52.16	.28	12.5	2.2	30.36	.58	22.2	2.6	6.19	.28	30.7	2.4	27.64	.32	43.1	2.6	55.59	.31	32.6	0.0
Feb. 9.9	52.44	.29	10.3	1.8	30.94	.65	19.6	2.1	6.47	.31	28.3	2.0	27.96	.36	40.5	2.2	55.90	.32	32.6	0.0
19.8	52.73	.31	8.5	1.3	31.59	.71	17.5	1.5	6.78	.32	26.3	1.4	28.32	.39	38.3	1.6	56.22	.34	32.6	0.0
Mar. 1.8	53.04	.31	7.2	0.7	32.30	.74	16.0	0.8	7.10	.33	24.9	0.9	28.71	.40	36.7	0.9	56.56	.35	32.6	0.1
11.8	53.35	.31	6.5	0.2	33.04	.76	15.2	0.1	7.43	.34	24.0	0.3	29.11	.40	35.8	0.3	56.91	.35	32.7	0.1
21.7	53.66	.31	6.3	0.3	33.80	.73	15.1	0.5	7.77	.33	23.7	0.4	29.51	.40	35.5	0.4	57.26	.34	32.8	0.1
31.7	53.97	.29	6.6	0.8	34.53	.69	15.6	1.2	8.10	.32	24.1	0.9	29.91	.39	35.9	1.0	57.60	.34	32.9	0.1
Apr. 10.7	54.26	.28	7.4	1.3	35.22	.64	16.8	1.7	8.42	.31	25.0	1.4	30.30	.36	36.9	1.6	57.94	.33	33.0	0.1
20.7	54.54	.26	8.7	1.7	35.86	.55	18.5	2.3	8.73	.28	26.4	1.9	30.66	.34	38.5	2.1	58.27	.31	33.1	0.2
30.6	54.80	.24	10.4	2.0	36.41	.46	20.8	2.6	9.01	.25	28.3	2.2	31.00	.29	40.6	2.5	58.58	.30	33.3	0.2
May 10.6	55.04	.20	12.4	2.3	36.87	.36	23.4	3.0	9.26	.22	30.5	2.6	31.29	.24	43.1	2.8	58.88	.27	33.5	0.2
20.6	55.24	.17	14.7	2.4	37.23	.24	26.4	3.1	9.48	.19	33.1	2.7	31.53	.20	45.9	3.0	59.15	.24	33.7	0.3
30.6	55.41	.14	17.1	2.5	37.47	.12	29.5	3.3	9.67	.14	35.8	2.9	31.73	.14	48.9	3.2	59.39	.20	34.0	0.4
June 9.5	55.55	.09	19.6	2.6	37.59	.00	32.8	3.3	9.81	.10	38.7	2.9	31.87	.08	52.1	3.2	59.59	.17	34.4	0.5
19.5	55.64	.06	22.2	2.4	37.59	.13	36.1	3.2	9.91	.05	41.6	2.8	31.95	.03	55.3	3.1	59.76	.13	34.9	0.5
29.5	55.70	.01	24.6	2.3	37.46	.24	39.3	3.0	9.96	.00	44.4	2.7	31.98	.04	58.4	3.0	59.89	.08	35.4	0.6
July 9.4	55.71	.03	26.9	2.2	37.22	.35	42.3	2.8	9.96	.04	47.1	2.5	31.94	.10	61.4	2.8	59.97	.03	36.0	0.6
19.4	55.68	.07	29.1	1.8	36.87	.46	45.1	2.4	9.92	.09	49.6	2.2	31.84	.15	64.2	2.5	60.00	.02	36.6	0.6
29.4	55.61	.12	30.9	1.6	36.41	.55	47.5	2.1	9.83	.13	51.8	1.9	31.69	.20	66.7	2.2	59.98	.06	37.2	0.6
Aug. 8.4	55.49	.15	32.5	1.3	35.86	.63	49.6	1.7	9.70	.17	53.7	1.6	31.49	.25	68.9	1.8	59.92	.10	37.8	0.5
18.3	55.34	.17	33.8	1.0	35.23	.69	51.3	1.2	9.53	.21	55.3	1.2	31.24	.29	70.7	1.3	59.82	.14	38.3	0.4
28.3	55.17	.20	34.8	0.5	34.54	.74	52.5	0.7	9.32	.23	56.5	0.8	30.95	.32	72.0	0.9	59.68	.17	38.7	0.4
Sept. 7.3	54.97	.21	35.3	0.2	33.80	.77	53.2	0.2	9.09	.24	57.3	0.3	30.63	.34	72.9	0.4	59.51	.18	39.1	0.2
17.3	54.76	.21	35.5	0.2	33.03	.78	53.4	0.3	8.85	.25	57.6	0.1	30.29	.34	73.3	0.2	59.33	.20	39.3	0.1
27.2	54.55	.21	35.3	0.6	32.25	.77	53.1	0.8	8.60	.25	57.5	0.6	29.95	.34	73.1	0.6	59.13	.19	39.4	0.0
Oct. 7.2	54.34	.20	34.7	1.1	31.48	.73	52.3	1.4	8.35	.23	56.9	1.0	29.61	.33	72.5	1.1	58.94	.17	39.4	0.2
17.2	54.14	.17	33.6	1.4	30.75	.68	50.9	1.9	8.12	.21	55.9	1.5	29.28	.29	71.4	1.7	58.77	.15	39.2	0.3
27.1	53.97	.13	32.2	1.7	30.07	.60	49.0	2.3	7.91	.17	54.4	1.9	28.99	.25	69.7	2.1	58.62	.11	38.9	0.4
Nov. 6.1	53.84	.09	30.5	2.2	29.47	.50	46.7	2.8	7.74	.13	52.5	2.3	28.74	.21	67.6	2.5	58.51	.07	38.5	0.4
16.1	53.75	.05	28.3	2.4	28.97	.40	43.9	3.1	7.61	.08	50.2	2.7	28.53	.15	65.1	2.9	58.44	.01	38.1	0.5
26.1	53.70	.00	25.9	2.7	28.57	.27	40.8	3.5	7.53	.03	47.5	2.9	28.38	.08	62.2	3.3	58.43	.04	37.6	0.4
Dec. 6.0	53.70	.06	23.2	2.9	28.30	.14	37.3	3.6	7.50	.03	44.6	3.1	28.30	.01	58.9	3.5	58.47	.09	37.2	0.4
16.0	53.76	.10	20.3	2.9	28.16	.00	33.7	3.7	7.53	.08	41.5	3.3	28.29	.06	55.4	3.5	58.56	.14	36.8	0.4
26.0	53.86	.15	17.4	3.0	28.16	.14	30.0	3.7	7.61	.14	38.2	3.3	28.35	.12	51.9	3.6	58.70	.19	36.4	0.3
36.0	54.01		14.4		28.30		26.3		7.75		34.9		28.47		48.3		58.89		36.1	

FIXED STARS, 1909.

(CONSTANTS OF STRUVE AND PETERS.)

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	*o* Herculis.				*μ* Sagittarii.				*η* Serpentis.				*λ* Sagittarii.				*χ* Draconis.			
	Right Ascension.		Declination *North.*		Right Ascension.		Declination *South.*		Right Ascension.		Declination *South.*		Right Ascension.		Declination *South.*		Right Ascension.		Declination *North.*	
	h m 18 3		° ′ +28 44		h m 18 8		° ′ −21 5		h m 18 16		° ′ − 2 55		h m 18 22		° ′ −25 28		h m 18 22		° ′ +72 41	
	s		″		s		″		s		″		s		″		s		″	
Jan. 1.0	57.24	.15	54.7	2.9	16.62	.19	0.8	0.4	33.63	.16	24.9	1.4	18.57	.18	23.5	0.0	37.80	.11	33.7	3.7
11.0	57.39	.20	51.8	2.8	16.81	.22	1.2	0.3	33.79	.20	26.3	1.3	18.75	.22	23.5	0.0	37.91	.24	30.0	3.5
20.9	57.59	.23	49.0	2.6	17.03	.26	1.5	0.3	33.99	.22	27.6	1.3	18.97	.25	23.5	0.0	38.15	.38	26.5	3.3
30.9	57.82	.26	46.4	2.3	17.29	.28	1.8	0.3	34.21	.25	28.9	1.1	19.22	.28	23.5	0.1	38.53	.49	23.2	3.0
Feb. 9.9	58.08	.28	44.1	1.8	17.57	.30	2.1	0.3	34.46	.27	30.0	0.9	19.50	.30	23.6	0.0	39.02	.60	20.2	2.5
19.8	58.36	.30	42.3	1.4	17.87	.31	2.4	0.3	34.73	.28	30.9	0.7	19.80	.31	23.6	0.0	39.62	.67	17.7	1.9
Mar. 1.8	58.66	.31	40.9	0.9	18.18	.32	2.7	0.1	35.01	.29	31.6	0.5	20.11	.33	23.6	0.0	40.29	.73	15.8	1.3
11.8	58.97	.31	40.0	0.3	18.50	.32	2.8	0.1	35.30	.29	32.1	0.2	20.44	.33	23.6	0.1	41.02	.76	14.5	0.6
21.8	59.28	.31	39.7	0.3	18.82	.32	2.9	0.1	35.59	.30	32.3	0.1	20.77	.33	23.5	0.1	41.78	.76	13.9	0.0
31.7	59.59	.31	40.0	0.7	19.14	.31	2.8	0.1	35.89	.29	32.2	0.4	21.10	.33	23.4	0.2	42.54	.75	13.9	0.7
Apr. 10.7	59.90	.29	40.7	1.2	19.45	.31	2.7	0.2	36.18	.28	31.8	0.6	21.43	.32	23.2	0.2	43.29	.71	14.6	1.3
20.7	60.19	.27	41.9	1.7	19.76	.29	2.5	0.2	36.46	.27	31.2	0.9	21.75	.31	23.0	0.2	44.00	.64	15.9	1.8
30.7	60.46	.26	43.6	2.0	20.05	.28	2.3	0.2	36.73	.26	30.3	1.0	22.06	.30	22.8	0.1	44.64	.56	17.7	2.4
May 10.6	60.72	.22	45.6	2.3	20.33	.26	2.1	0.3	36.99	.24	29.3	1.1	22.36	.28	22.7	0.1	45.20	.47	20.1	2.7
20.6	60.94	.19	47.9	2.5	20.59	.23	1.8	0.2	37.23	.21	28.2	1.1	22.64	.25	22.6	0.1	45.67	.36	22.8	3.0
30.6	61.13	.16	50.4	2.6	20.82	.20	1.6	0.2	37.44	.19	27.1	1.2	22.89	.22	22.5	0.0	46.03	.24	25.8	3.2
June 9.5	61.29	.12	53.0	2.6	21.02	.17	1.4	0.1	37.63	.15	25.9	1.2	23.11	.18	22.5	0.1	46.27	.11	29.0	3.4
19.5	61.41	.07	55.6	2.6	21.19	.12	1.3	0.1	37.78	.12	24.7	1.1	23.29	.14	22.6	0.1	46.38	.01	32.4	3.3
29.5	61.48	.03	58.2	2.5	21.31	.08	1.2	0.0	37.90	.08	23.6	1.1	23.43	.10	22.7	0.2	46.37	.14	35.7	3.2
July 9.5	61.51	.01	60.7	2.3	21.39	.04	1.2	0.1	37.98	.03	22.5	0.9	23.53	.05	22.9	0.3	46.23	.26	38.9	3.1
19.4	61.50	.06	63.0	2.1	21.43	.01	1.3	0.1	38.01	.01	21.6	0.8	23.58	.01	23.2	0.4	45.97	.38	42.0	2.9
29.4	61.44	.10	65.1	1.8	21.42	.05	1.4	0.1	38.00	.05	20.8	0.6	23.59	.04	23.6	0.4	45.59	.48	44.9	2.5
Aug. 8.4	61.34	.14	66.9	1.5	21.37	.09	1.5	0.2	37.95	.08	20.2	0.5	23.55	.08	24.0	0.4	45.11	.58	47.4	2.2
18.4	61.20	.17	68.4	1.1	21.28	.12	1.7	0.2	37.87	.12	19.7	0.4	23.47	.12	24.4	0.4	44.53	.66	49.6	1.8
28.3	61.03	.19	69.5	0.8	21.16	.15	1.9	0.2	37.75	.14	19.3	0.2	23.35	.15	24.8	0.3	43.87	.73	51.4	1.3
Sept. 7.3	60.84	.21	70.3	0.4	21.01	.17	2.1	0.1	37.61	.16	19.1	0.1	23.20	.17	25.1	0.3	43.14	.77	52.7	0.8
17.3	60.63	.22	70.7	0.1	20.84	.17	2.2	0.1	37.45	.17	19.0	0.1	23.03	.18	25.4	0.2	42.37	.80	53.5	0.3
27.2	60.41	.21	70.6	0.4	20.67	.18	2.3	0.1	37.28	.17	19.1	0.2	22.85	.19	25.6	0.1	41.57	.80	53.8	0.2
Oct. 7.2	60.20	.21	70.2	0.8	20.49	.16	2.4	0.1	37.11	.16	19.3	0.4	22.66	.17	25.7	0.0	40.77	.79	53.6	0.7
17.2	59.99	.18	69.4	1.2	20.33	.14	2.5	0.0	36.95	.14	19.7	0.5	22.49	.15	25.7	0.1	39.98	.75	52.9	1.3
27.2	59.81	.15	68.2	1.6	20.19	.11	2.5	0.0	36.81	.11	20.2	0.6	22.34	.12	25.6	0.1	39.23	.69	51.6	1.8
Nov. 6.1	59.66	.11	66.6	2.0	20.08	.07	2.5	0.0	36.70	.08	20.8	0.8	22.22	.08	25.5	0.1	38.54	.61	49.8	2.3
16.1	59.55	.07	64.6	2.3	20.01	.02	2.5	0.0	36.62	.03	21.6	1.0	22.14	.03	25.4	0.2	37.93	.51	47.5	2.7
26.1	59.48	.02	62.3	2.6	19.99	.03	2.5	0.1	36.59	.01	22.6	1.1	22.11	.01	25.2	0.2	37.42	.39	44.8	3.1
Dec. 6.1	59.46	.03	59.7	2.8	20.02	.08	2.6	0.1	36.60	.05	23.7	1.2	22.12	.07	25.0	0.1	37.03	.27	41.7	3.4
16.0	59.49	.08	56.9	2.9	20.10	.12	2.7	0.2	36.65	.10	24.9	1.3	22.19	.11	24.9	0.1	36.76	.13	38.3	3.6
26.0	59.57	.13	54.0	3.0	20.22	.17	2.9	0.3	36.75	.14	26.2	1.4	22.30	.16	24.8	0.1	36.63	.02	34.7	3.7
36.0	59.70		51.0		20.39		3.2		36.89		27.6		22.46		24.7		36.65		31.0	

(CONSTANTS OF STRUVE AND PETERS.)

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	ι Aquilæ.				ζ Pavonis.				α Lyræ. (*Vega.*)				β Lyræ.				50 Draconis.			
	Right Ascension.		Declination *South.*		Right Ascension.		Declination *South.*		Right Ascension.		Declination *North.*		Right Ascension.		Declination *North.*		Right Ascension.		Declination *North.*	
	h m 18 30		° ′ − 8 18		h m 18 32		° ′ −71 30		h m 18 33		° ′ +38 41		h m 18 46		° ′ +33 15		h m 18 49		° ′ +75 19	
	s		″		s		″		s		″		s		″		s		″	
Jan. 1.0	12.85	.16	32.4	1.0	17.68	.36	27.0	2.6	49.03	.12	51.9	3.3	40.84	.10	21.0	3.0	14.18	.00	35.3	3.6
11.0	13.01	.18	33.4	1.0	18.04	.49	24.4	2.5	49.15	.16	48.6	3.1	40.94	.15	18.0	3.0	14.18	.16	31.7	3.6
21.0	13.19	.22	34.4	0.9	18.53	.59	21.9	2.2	49.31	.21	45.5	2.9	41.09	.19	15.0	2.8	14.34	.32	28.1	3.4
30.9	13.41	.25	35.3	0.8	19.12	.67	19.7	2.0	49.52	.24	42.6	2.6	41.28	.22	12.2	2.5	14.66	.47	24.7	3.1
Feb. 9.9	13.66	.26	36.1	0.7	19.79	.75	17.7	1.7	49.76	.28	40.0	2.2	41.50	.26	9.7	2.1	15.13	.61	21.6	2.7
19.9	13.92	.28	36.8	0.5	20.54	.80	16.0	1.3	50.04	.30	37.8	1.7	41.76	.28	7.6	1.7	15.74	.71	18.9	2.2
Mar. 1.8	14.20	.29	37.3	0.3	21.34	.85	14.7	0.9	50.34	.32	36.1	1.2	42.04	.30	5.9	1.2	16.45	.80	16.7	1.6
11.8	14.49	.30	37.6	0.0	22.19	.86	13.8	0.6	50.66	.34	34.9	0.6	42.34	.32	4.7	0.6	17.25	.85	15.1	1.0
21.8	14.79	.30	37.6	0.2	23.05	.88	13.2	0.2	51.00	.34	34.3	0.0	42.66	.32	4.1	0.0	18.10	.88	14.1	0.3
31.8	15.09	.30	37.4	0.3	23.93	.87	13.0	0.2	51.34	.34	34.3	0.7	42.98	.32	4.1	0.5	18.98	.87	13.8	0.3
Apr. 10.7	15.39	.29	37.1	0.6	24.80	.85	13.2	0.6	51.68	.33	35.0	1.2	43.30	.32	4.6	1.1	19.85	.84	14.1	1.0
20.7	15.68	.29	36.5	0.7	25.65	.81	13.8	0.9	52.01	.31	36.2	1.6	43.62	.30	5.7	1.5	20.69	.79	15.1	1.6
30.7	15.97	.27	35.8	0.9	26.46	.76	14.7	1.3	52.32	.29	37.8	2.1	43.92	.29	7.2	2.0	21.48	.70	16.7	2.1
May 10.6	16.24	.26	34.9	0.9	27.22	.70	16.0	1.6	52.61	.26	39.9	2.5	44.21	.27	9.2	2.3	22.18	.60	18.8	2.5
20.6	16.50	.23	34.0	1.0	27.92	.62	17.6	1.9	52.87	.23	42.4	2.7	44.48	.23	11.5	2.6	22.78	.48	21.3	2.9
30.6	16.73	.20	33.0	1.0	28.54	.53	19.5	2.2	53.10	.18	45.1	2.9	44.71	.20	14.1	2.7	23.26	.34	24.2	3.1
June 9.6	16.93	.17	32.0	0.9	29.07	.42	21.7	2.4	53.28	.15	48.0	3.0	44.91	.16	16.8	2.8	23.60	.20	27.3	3.3
19.5	17.10	.14	31.1	0.9	29.49	.31	24.1	2.5	53.43	.09	51.0	3.0	45.07	.11	19.6	2.9	23.80	.05	30.6	3.4
29.5	17.24	.09	30.2	0.7	29.80	.19	26.6	2.6	53.52	.05	54.0	2.9	45.18	.07	22.5	2.8	23.85	.09	34.0	3.3
July 9.5	17.33	.05	29.5	0.7	29.99	.06	29.2	2.6	53.57	.00	56.9	2.8	45.25	.02	25.3	2.6	23.76	.24	37.3	3.3
19.5	17.38	.01	28.8	0.6	30.05	.06	31.8	2.5	53.57	.06	59.7	2.6	45.27	.03	27.9	2.5	23.52	.38	40.6	3.0
29.4	17.39	.04	28.2	0.4	29.99	.18	34.3	2.4	53.51	.10	62.3	2.3	45.24	.07	30.4	2.3	23.14	.51	43.6	2.8
Aug. 8.4	17.35	.07	27.8	0.4	29.81	.30	36.7	2.1	53.41	.15	64.6	2.0	45.17	.12	32.7	1.9	22.63	.63	46.4	2.5
18.4	17.28	.11	27.4	0.2	29.51	.40	38.8	1.8	53.26	.18	66.6	1.6	45.05	.16	34.6	1.6	22.00	.74	48.9	2.2
28.4	17.17	.13	27.2	0.1	29.11	.49	40.6	1.4	53.08	.22	68.2	1.2	44.89	.19	36.2	1.2	21.26	.83	51.1	1.7
Sept. 7.3	17.04	.16	27.1	0.0	28.62	.54	42.0	1.0	52.86	.24	69.4	0.8	44.70	.21	37.4	0.8	20.43	.89	52.8	1.2
17.3	16.88	.17	27.1	0.1	28.08	.58	43.0	0.6	52.62	.26	70.2	0.3	44.49	.23	38.2	0.5	19.54	.93	54.0	0.8
27.3	16.71	.17	27.2	0.2	27.50	.59	43.6	0.0	52.36	.25	70.5	0.1	44.26	.23	38.7	0.0	18.61	.96	54.8	0.3
Oct. 7.2	16.54	.16	27.4	0.3	26.91	.57	43.6	0.5	52.11	.25	70.4	0.6	44.03	.23	38.7	0.5	17.65	.95	55.1	0.3
17.2	16.38	.14	27.7	0.3	26.34	.53	43.1	1.0	51.86	.24	69.8	1.0	43.80	.21	38.2	0.9	16.70	.93	54.8	0.8
27.2	16.24	.11	28.0	0.5	25.81	.45	42.1	1.4	51.62	.20	68.8	1.5	43.59	.19	37.3	1.3	15.77	.87	54.0	1.4
Nov. 6.2	16.13	.09	28.5	0.6	25.36	.36	40.7	1.9	51.42	.17	67.3	2.0	43.40	.16	36.0	1.7	14.90	.80	52.6	1.9
16.1	16.04	.04	29.1	0.7	25.00	.24	38.8	2.2	51.25	.12	65.3	2.3	43.24	.11	34.3	2.1	14.10	.69	50.7	2.4
26.1	16.00	.00	29.8	0.7	24.76	.11	36.6	2.4	51.13	.08	63.0	2.7	43.13	.08	32.2	2.5	13.41	.57	48.3	2.8
Dec. 6.1	16.00	.05	30.5	0.9	24.65	.02	34.2	2.6	51.05	.02	60.3	2.9	43.05	.02	29.7	2.7	12.84	.43	45.5	3.1
16.0	16.05	.09	31.4	0.9	24.67	.16	31.6	2.7	51.03	.03	57.4	3.1	43.03	.03	27.0	2.9	12.41	.28	42.4	3.4
26.0	16.14	.14	32.3	1.0	24.83	.30	28.9	2.7	51.06	.08	54.3	3.3	43.06	.07	24.1	3.0	12.13	.11	39.0	3.5
36.0	16.28		33.3		25.13		26.2		51.14		51.0		43.13		21.1		12.02		35.5	

(CONSTANTS OF STRUVE AND PETERS.)

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	*σ* Sagittarii.				*γ* Lyræ.				*ζ* Aquilæ.				*ι* Lyræ.				*d* Sagittarii.			
	Right Ascension.		Declination *South.*		Right Ascension.		Declination *North.*		Right Ascension.		Declination *North.*		Right Ascension.		Declination *North.*		Right Ascension.		Declination *South.*	
	h m 18 49		° ′ −26 24		h m 18 55		° ′ +32 33		h m 19 1		° ′ +13 43		h m 19 4		° ′ +35 57		h m 19 12		° ′ −19 6	
	s		″		s		″		s		″		s		″		s		″	
Jan. 1.0	34.61	.16	41.2	0.2	30.00	.09	48.8	3.0	11.34	.10	36.3	2.1	0.91	.08	22.9	3.1	16.09	.12	60.4	0.2
11.0	34.77	.19	41.0	0.2	30.09	.13	45.8	2.9	11.44	.14	34.2	2.1	0.99	.12	19.8	3.0	16.21	.16	60.6	0.2
21.0	34.96	.23	40.8	0.2	30.22	.18	42.9	2.8	11.58	.18	32.1	2.0	1.11	.17	16.8	2.9	16.37	.20	60.8	0.1
30.9	35.19	.26	40.6	0.2	30.40	.22	40.1	2.5	11.76	.21	30.1	1.7	1.28	.21	13.9	2.6	16.57	.22	60.9	0.0
Feb. 9.9	35.45	.28	40.4	0.2	30.62	.25	37.6	2.1	11.97	.23	28.4	1.5	1.49	.25	11.3	2.3	16.79	.25	60.9	0.0
19.9	35.73	.30	40.2	0.2	30.87	.27	35.5	1.7	12.20	.25	26.9	1.2	1.74	.27	9.0	1.9	17.04	.27	60.9	0.1
Mar. 1.9	36.03	.31	40.0	0.3	31.14	.30	33.8	1.2	12.45	.27	25.7	0.8	2.01	.30	7.1	1.3	17.31	.29	60.8	0.2
11.8	36.34	.33	39.7	0.3	31.44	.31	32.6	0.7	12.72	.28	24.9	0.3	2.31	.31	5.8	0.7	17.60	.30	60.6	0.4
21.8	36.67	.33	39.4	0.4	31.75	.31	31.9	0.1	13.00	.29	24.6	0.0	2.62	.33	5.1	0.2	17.90	.31	60.2	0.5
31.8	37.00	.34	39.0	0.4	32.06	.32	31.8	0.5	13.29	.30	24.6	0.5	2.95	.33	4.9	0.4	18.21	.32	59.7	0.6
Apr. 10.7	37.34	.33	38.6	0.4	32.38	.32	32.3	1.0	13.59	.29	25.1	0.9	3.28	.33	5.3	0.9	18.53	.31	59.1	0.6
20.7	37.67	.33	38.2	0.4	32.70	.31	33.3	1.5	13.88	.29	26.0	1.2	3.61	.32	6.2	1.5	18.84	.32	58.5	0.7
30.7	38.00	.31	37.8	0.3	33.01	.29	34.8	1.9	14.17	.28	27.2	1.6	3.93	.30	7.7	1.9	19.16	.31	57.8	0.7
May 10.7	38.31	.30	37.5	0.3	33.30	.27	36.7	2.2	14.45	.26	28.8	1.8	4.23	.28	9.6	2.3	19.47	.29	57.1	0.8
20.6	38.61	.27	37.2	0.2	33.57	.24	38.9	2.6	14.71	.24	30.6	2.0	4.51	.25	11.9	2.6	19.76	.28	56.3	0.7
30.6	38.88	.25	37.0	0.1	33.81	.21	41.5	2.7	14.95	.22	32.6	2.1	4.76	.22	14.5	2.8	20.04	.25	55.6	0.6
June 9.6	39.13	.21	36.9	0.0	34.02	.17	44.2	2.8	15.17	.18	34.7	2.1	4.98	.18	17.3	2.9	20.29	.22	55.0	0.5
19.6	39.34	.17	36.9	0.1	34.19	.12	47.0	2.8	15.35	.14	36.8	2.1	5.16	.13	20.2	3.0	20.51	.18	54.5	0.4
29.5	39.51	.13	37.0	0.2	34.31	.08	49.8	2.8	15.49	.10	38.9	2.1	5.29	.08	23.2	2.9	20.69	.14	54.1	0.3
July 9.5	39.64	.08	37.2	0.3	34.39	.03	52.6	2.7	15.59	.06	41.0	1.9	5.37	.04	26.1	2.8	20.83	.10	53.8	0.2
19.5	39.72	.03	37.5	0.4	34.42	.02	55.3	2.5	15.65	.02	42.9	1.8	5.41	.02	28.9	2.7	20.93	.05	53.6	0.1
29.4	39.75	.02	37.9	0.4	34.40	.06	57.8	2.3	15.67	.03	44.7	1.5	5.39	.06	31.6	2.4	20.98	.01	53.5	0.1
Aug. 8.4	39.73	.06	38.3	0.5	34.34	.11	60.1	2.0	15.64	.07	46.2	1.4	5.33	.11	34.0	2.2	20.99	.04	53.6	0.2
18.4	39.67	.10	38.8	0.5	34.23	.15	62.1	1.6	15.57	.10	47.6	1.1	5.22	.16	36.2	1.8	20.95	.08	53.8	0.2
28.4	39.57	.13	39.3	0.5	34.08	.18	63.7	1.3	15.47	.14	48.7	0.8	5.06	.18	38.0	1.4	20.87	.12	54.0	0.3
Sept. 7.3	39.44	.17	39.8	0.4	33.90	.21	65.0	0.9	15.33	.16	49.5	0.5	4.88	.22	39.4	1.1	20.75	.14	54.3	0.3
17.3	39.27	.17	40.2	0.3	33.69	.22	65.9	0.5	15.17	.17	50.0	0.3	4.66	.23	40.5	0.6	20.61	.16	54.6	0.3
27.3	39.10	.19	40.5	0.3	33.47	.23	66.4	0.1	15.00	.18	50.3	0.0	4.43	.25	41.1	0.2	20.45	.18	54.9	0.3
Oct. 7.3	38.91	.18	40.8	0.1	33.24	.22	66.5	0.3	14.82	.18	50.3	0.3	4.18	.24	41.3	0.3	20.27	.17	55.2	0.3
17.2	38.73	.16	40.9	0.1	33.02	.22	66.2	0.8	14.64	.17	50.0	0.7	3.94	.23	41.0	0.7	20.10	.15	55.5	0.2
27.2	38.57	.13	41.0	0.1	32.80	.19	65.4	1.3	14.47	.15	49.3	0.9	3.71	.20	40.3	1.2	19.95	.14	55.7	0.2
Nov. 6.2	38.44	.10	40.9	0.1	32.61	.16	64.1	1.6	14.32	.12	48.4	1.2	3.51	.18	39.1	1.6	19.81	.11	55.9	0.2
16.1	38.34	.06	40.8	0.2	32.45	.12	62.5	2.0	14.20	.08	47.2	1.4	3.33	.14	37.5	2.0	19.70	.07	56.1	0.2
26.1	38.28	.01	40.6	0.2	32.33	.08	60.5	2.4	14.12	.04	45.8	1.7	3.19	.09	35.5	2.4	19.63	.03	56.3	0.1
Dec. 6.1	38.27	.04	40.4	0.3	32.25	.03	58.1	2.6	14.08	.00	44.1	1.9	3.10	.05	33.1	2.6	19.60	.01	56.4	0.2
16.1	38.31	.08	40.1	0.2	32.22	.02	55.5	2.8	14.08	.04	42.2	2.0	3.05	.00	30.5	2.9	19.61	.06	56.6	0.2
26.0	38.39	.13	39.9	0.2	32.24	.07	52.7	3.0	14.12	.08	40.2	2.1	3.05	.05	27.6	3.0	19.67	.10	56.8	0.1
36.0	38.52		39.7		32.31		49.7		14.20		38.1		3.10		24.6		19.77		56.9	

(CONSTANTS OF STRUVE AND PETERS.)

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	δ Draconis.				θ Lyræ.				σ Octantis.				τ Draconis.				δ Aquilæ.			
	Right Ascension.		Declination North.		Right Ascension.		Declination North.		Right Ascension.		Declination South.		Right Ascension.		Declination North.		Right Ascension.		Declination North.	
	h m 19 12		° ′ +67 29		h m 19 13		° ′ +37 57		h 19		° ′ −89 14		h m 19 17		° ′ +73 10		h m 19 20		° ′ + 2 55	
	s		″		s		″		m s		″		s		″		s		″	
Jan. 1.0	28.69	.02	65.0	3.6	10.14	.07	74.9	3.1	12 35.1	3.5	29.8	3.3	14.31	.08	72.7	3.5	52.29	.09	54.0	1.5
11.0	28.67	.09	61.4	3.6	10.21	.11	71.8	3.1	12 38.6	6.5	26.5	3.3	14.23	.06	69.2	3.6	52.38	.13	52.5	1.4
21.0	28.76	.20	57.8	3.5	10.32	.16	68.7	2.9	12 45.1	9.4	23.2	3.2	14.29	.20	65.6	3.5	52.51	.17	51.1	1.4
30.9	28.96	.29	54.3	3.2	10.48	.20	65.8	2.7	12 54.5	12.0	20.0	2.9	14.49	.34	62.1	3.2	52.68	.19	49.7	1.2
Feb. 9.9	29.25	.38	51.1	2.8	10.68	.24	63.1	2.4	13 6.5	14.1	17.1	2.5	14.83	.46	58.9	2.9	52.87	.22	48.5	1.0
19.9	29.63	.46	48.3	2.4	10.92	.27	60.7	1.9	13 20.6	16.0	14.6	2.2	15.29	.57	56.0	2.5	53.09	.24	47.5	0.7
Mar. 1.9	30.09	.52	45.9	1.9	11.19	.30	58.8	1.4	13 36.6	17.4	12.4	1.8	15.86	.66	53.5	1.9	53.33	.26	46.8	0.5
11.8	30.61	.57	44.0	1.2	11.49	.31	57.4	0.9	13 54.0	18.4	10.6	1.4	16.52	.72	51.6	1.3	53.59	.28	46.3	0.1
21.8	31.18	.60	42.8	0.5	11.80	.33	56.5	0.3	14 12.4	19.1	9.2	0.8	17.24	.76	50.3	0.7	53.87	.28	46.2	0.2
31.8	31.78	.61	42.3	0.1	12.13	.34	56.2	0.3	14 31.5	19.3	8.4	0.4	18.00	.78	49.6	0.0	54.15	.30	46.4	0.5
Apr. 10.8	32.39	.59	42.4	0.7	12.47	.33	56.5	0.9	14 50.8	19.1	8.0	0.1	18.78	.77	49.6	0.7	54.45	.29	46.9	0.8
20.7	32.98	.57	43.1	1.4	12.80	.33	57.4	1.4	15 9.9	18.6	8.1	0.5	19.55	.73	50.3	1.3	54.74	.30	47.7	1.1
30.7	33.55	.53	44.5	1.9	13.13	.32	58.8	1.9	15 28.5	17.6	8.6	1.1	20.28	.67	51.6	1.8	55.04	.28	48.8	1.4
May 10.7	34.08	.47	46.4	2.4	13.45	.29	60.7	2.3	15 46.1	16.4	9.7	1.4	20.95	.60	53.4	2.3	55.32	.28	50.2	1.5
20.6	34.55	.40	48.8	2.8	13.74	.26	63.0	2.6	16 2.5	14.7	11.1	1.9	21.55	.50	55.7	2.7	55.60	.26	51.7	1.6
30.6	34.95	.32	51.6	3.1	14.00	.23	65.6	2.8	16 17.2	12.8	13.0	2.3	22.05	.40	58.4	3.0	55.86	.23	53.3	1.7
June 9.6	35.27	.23	54.7	3.3	14.23	.19	68.4	3.0	16 30.0	10.5	15.3	2.6	22.45	.27	61.4	3.3	56.09	.20	55.0	1.7
19.6	35.50	.14	58.0	3.4	14.42	.14	71.4	3.0	16 40.5	7.9	17.9	2.8	22.72	.15	64.7	3.4	56.29	.17	56.7	1.6
29.5	35.64	.03	61.4	3.4	14.56	.09	74.4	3.1	16 48.4	5.3	20.7	3.0	22.87	.02	68.1	3.4	56.46	.13	58.3	1.6
July 9.5	35.67	.06	64.8	3.4	14.65	.04	77.5	2.9	16 53.7	2.4	23.7	3.1	22.89	.11	71.5	3.4	56.59	.09	59.9	1.4
19.5	35.61	.16	68.2	3.3	14.69	.01	80.4	2.8	16 56.1	0.5	26.8	3.1	22.78	.24	74.9	3.3	56.68	.05	61.3	1.3
29.5	35.45	.26	71.5	3.0	14.68	.06	83.2	2.5	16 55.6	3.4	29.9	3.0	22.54	.36	78.2	3.1	56.73	.00	62.6	1.2
Aug. 8.4	35.19	.34	74.5	2.8	14.62	.11	85.7	2.3	16 52.2	6.2	32.9	2.8	22.18	.47	81.3	2.8	56.73	.04	63.8	0.9
18.4	34.85	.42	77.3	2.4	14.51	.15	88.0	1.9	16 46.0	8.9	35.7	2.5	21.71	.57	84.1	2.5	56.69	.08	64.7	0.7
28.4	34.43	.49	79.7	2.0	14.36	.19	89.9	1.6	16 37.1	11.1	38.2	2.2	21.14	.66	86.6	2.1	56.61	.11	65.4	0.6
Sept. 7.3	33.94	.54	81.7	1.6	14.17	.22	91.5	1.2	16 26.0	13.0	40.4	1.6	20.48	.73	88.7	1.6	56.50	.14	66.0	0.3
17.3	33.40	.57	83.3	1.1	13.95	.24	92.7	0.7	16 13.0	14.5	42.0	1.1	19.75	.78	90.3	1.2	56.36	.16	66.3	0.2
27.3	32.83	.60	84.4	0.5	13.71	.25	93.4	0.3	15 58.5	15.3	43.1	0.6	18.97	.82	91.5	0.7	56.20	.17	66.5	0.1
Oct. 7.3	32.23	.61	84.9	0.1	13.46	.25	93.7	0.1	15 43.2	15.5	43.7	0.1	18.15	.83	92.2	0.2	56.03	.16	66.4	0.2
17.2	31.62	.59	85.0	0.5	13.21	.24	93.6	0.6	15 27.7	15.2	43.6	0.7	17.32	.81	92.4	0.4	55.87	.16	66.2	0.4
27.2	31.03	.57	84.5	1.1	12.97	.22	93.0	1.1	15 12.5	14.1	42.9	1.3	16.51	.78	92.0	0.9	55.71	.14	65.8	0.7
Nov. 6.2	30.46	.52	83.4	1.6	12.75	.19	91.9	1.5	14 58.4	12.5	41.6	1.9	15.73	.73	91.1	1.5	55.57	.12	65.1	0.9
16.2	29.94	.45	81.8	2.1	12.56	.15	90.4	2.0	14 45.9	10.3	39.7	2.3	15.00	.65	89.6	2.0	55.45	.08	64.2	1.0
26.1	29.49	.38	79.7	2.6	12.41	.11	88.4	2.4	14 35.6	7.7	37.4	2.8	14.35	.55	87.6	2.5	55.37	.04	63.2	1.1
Dec. 6.1	29.11	.29	77.1	3.0	12.30	.06	86.0	2.6	14 27.9	4.9	34.6	3.1	13.80	.44	85.1	2.9	55.33	.01	62.1	1.3
16.1	28.82	.19	74.1	3.3	12.24	.02	83.4	2.9	14 23.0	1.7	31.5	3.3	13.36	.31	82.2	3.2	55.32	.04	60.8	1.4
26.0	28.63	.08	70.8	3.5	12.22	.04	80.5	3.1	14 21.3	1.5	28.2	3.4	13.05	.17	79.0	3.4	55.36	.07	59.4	1.5
36.0	28.55		67.3		12.26		77.4		14 22.8		24.8		12.88		75.6		55.43		57.9	

(CONSTANTS OF STRUVE AND PETERS.)

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	β Cygni.				κ Aquilæ.				β Sagittæ.				γ Aquilæ.				δ Cygni.			
	Right Ascension.		Declination *North.*		Right Ascension.		Declination *South.*		Right Ascension.		Declination *North.*		Right Ascension.		Declination *North.*		Right Ascension.		Declination *North.*	
	h m 19 27		° ′ +27 45		h m 19 31		° ′ − 7 13		h m 19 36		° ′ +17 15		h m 19 41		° ′ +10 23		h m 19 42		° ′ +44 54	
	s		″		s		″		s		″		s		″		s		″	
Jan. 1.0	0.77	.06	62.8	2.7	57.41	.09	53.9	0.9	55.42	.07	50.0	2.2	53.73	.07	23.7	1.8	5.41	.02	29.3	3.2
11.0	0.83	.11	60.1	2.7	57.50	.13	54.8	0.8	55.49	.10	47.8	2.2	53.80	.10	21.9	1.8	5.43	.07	26.1	3.2
21.0	0.94	.14	57.4	2.6	57.63	.16	55.6	0.8	55.59	.14	45.6	2.1	53.90	.14	20.1	1.7	5.50	.12	22.9	3.1
31.0	1.08	.18	54.8	2.4	57.79	.19	56.4	0.6	55.73	.17	43.5	1.9	54.04	.17	18.4	1.6	5.62	.17	19.8	3.0
Feb. 9.9	1.26	.22	52.4	2.0	57.98	.22	57.0	0.5	55.90	.20	41.6	1.6	54.21	.20	16.8	1.3	5.79	.22	16.8	2.6
19.9	1.48	.24	50.4	1.7	58.20	.24	57.5	0.3	56.10	.23	40.0	1.3	54.41	.22	15.5	1.1	6.01	.26	14.2	2.3
Mar. 1.9	1.72	.27	48.7	1.3	58.44	.26	57.8	0.0	56.33	.25	38.7	1.0	54.63	.25	14.4	0.7	6.27	.29	11.9	1.7
11.9	1.99	.29	47.4	0.7	58.70	.28	57.8	0.1	56.58	.27	37.7	0.5	54.88	.26	13.7	0.3	6.56	.33	10.2	1.2
21.8	2.28	.30	46.7	0.2	58.98	.28	57.7	0.4	56.85	.29	37.2	0.1	55.14	.28	13.4	0.1	6.89	.35	9.0	0.6
31.8	2.58	.31	46.5	0.3	59.26	.30	57.3	0.6	57.14	.29	37.1	0.4	55.42	.29	13.5	0.4	7.24	.36	8.4	0.0
Apr. 10.8	2.89	.31	46.8	0.8	59.56	.31	56.7	0.9	57.43	.30	37.5	0.8	55.71	.30	13.9	0.8	7.60	.36	8.4	0.6
20.7	3.20	.31	47.6	1.3	59.87	.30	55.8	1.0	57.73	.30	38.3	1.2	56.01	.30	14.7	1.2	7.96	.37	9.0	1.2
30.7	3.51	.30	48.9	1.7	60.17	.29	54.8	1.1	58.03	.30	39.5	1.6	56.31	.29	15.9	1.5	8.33	.35	10.2	1.7
May 10.7	3.81	.28	50.6	2.1	60.46	.29	53.7	1.2	58.33	.28	41.1	1.9	56.60	.28	17.4	1.7	8.68	.33	11.9	2.1
20.7	4.09	.27	52.7	2.4	60.75	.27	52.5	1.3	58.61	.26	43.0	2.0	56.88	.27	19.1	1.9	9.01	.30	14.0	2.6
30.6	4.36	.23	55.1	2.5	61.02	.25	51.2	1.3	58.87	.24	45.0	2.3	57.15	.24	21.0	2.0	9.31	.27	16.6	2.9
June 9.6	4.59	.20	57.6	2.7	61.27	.22	49.9	1.2	59.11	.21	47.3	2.3	57.39	.22	23.0	2.1	9.58	.22	19.5	3.0
19.6	4.79	.16	60.3	2.7	61.49	.19	48.7	1.2	59.32	.17	49.6	2.3	57.61	.18	25.1	2.0	9.80	.18	22.5	3.2
29.6	4.95	.12	63.0	2.8	61.68	.15	47.5	1.0	59.49	.14	51.9	2.3	57.79	.14	27.1	2.0	9.98	.12	25.7	3.3
July 9.5	5.07	.07	65.8	2.6	61.83	.11	46.5	0.9	59.63	.09	54.2	2.3	57.93	.10	29.1	1.9	10.10	.07	29.0	3.2
19.5	5.14	.02	68.4	2.5	61.94	.06	45.6	0.8	59.72	.05	56.5	2.0	58.03	.06	31.0	1.8	10.17	.01	32.2	3.1
29.5	5.16	.03	70.9	2.3	62.00	.02	44.8	0.6	59.77	.00	58.5	1.9	58.09	.01	32.8	1.6	10.18	.05	35.3	2.9
Aug. 8.4	5.13	.07	73.2	2.0	62.02	.03	44.2	0.5	59.77	.05	60.4	1.7	58.10	.03	34.4	1.3	10.13	.10	38.2	2.7
18.4	5.06	.11	75.2	1.7	61.99	.07	43.7	0.3	59.72	.08	62.1	1.4	58.07	.07	35.7	1.1	10.03	.16	40.9	2.4
28.4	4.95	.14	76.9	1.4	61.92	.10	43.4	0.2	59.64	.12	63.5	1.1	58.00	.10	36.8	0.9	9.87	.19	43.3	2.0
Sept. 7.4	4.81	.18	78.3	1.1	61.82	.13	43.2	0.0	59.52	.14	64.6	0.9	57.90	.14	37.7	0.7	9.68	.24	45.3	1.6
17.3	4.63	.19	79.4	0.7	61.69	.15	43.2	0.1	59.38	.17	65.5	0.5	57.76	.15	38.4	0.4	9.44	.26	46.9	1.2
27.3	4.44	.21	80.1	0.3	61.54	.16	43.3	0.1	59.21	.18	66.0	0.2	57.61	.17	38.8	0.1	9.18	.27	48.1	0.7
Oct. 7.3	4.23	.21	80.4	0.0	61.38	.16	43.4	0.3	59.03	.18	66.2	0.1	57.44	.17	38.9	0.1	8.91	.28	48.8	0.3
17.3	4.02	.20	80.4	0.5	61.22	.16	43.7	0.4	58.85	.18	66.1	0.4	57.27	.17	38.8	0.4	8.63	.28	49.1	0.3
27.2	3.82	.18	79.9	0.9	61.06	.14	44.1	0.5	58.67	.16	65.7	0.7	57.10	.15	38.4	0.7	8.35	.27	48.8	0.7
Nov. 6.2	3.64	.16	79.0	1.3	60.92	.11	44.6	0.6	58.51	.14	65.0	1.1	56.95	.13	37.7	0.9	8.08	.24	48.1	1.3
16.2	3.48	.13	77.7	1.7	60.81	.08	45.2	0.6	58.37	.11	63.9	1.3	56.82	.10	36.8	1.2	7.84	.21	46.8	1.7
26.1	3.35	.09	76.0	1.9	60.73	.05	45.8	0.7	58.26	.07	62.6	1.6	56.72	.07	35.6	1.3	7.63	.16	45.1	2.2
Dec. 6.1	3.26	.05	74.1	2.3	60.68	.01	46.5	0.8	58.19	.04	61.0	1.9	56.65	.03	34.3	1.6	7.47	.12	42.9	2.5
16.1	3.21	.00	71.8	2.5	60.67	.04	47.3	0.8	58.15	.00	59.1	2.0	56.62	.01	32.7	1.7	7.35	.07	40.4	2.9
26.1	3.21	.03	69.3	2.6	60.71	.07	48.1	0.8	58.15	.05	57.1	2.2	56.63	.05	31.0	1.7	7.28	.02	37.5	3.1
36.0	3.24		66.7		60.78		48.9		58.20		54.9		56.68		29.3		7.26		34.4	

FIXED STARS, 1909.

(CONSTANTS OF STRUVE AND PETERS.)

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Aquilæ. (*Altair.*)				ε Draconis.				ε Pavonis.				β Aquilæ.				γ Sagittæ.			
	Right Ascension.		Declination *North.*		Right Ascension.		Declination *North.*		Right Ascension.		Declination *South.*		Right Ascension.		Declination *North.*		Right Ascension.		Declination *North.*	
	h m 19 46		° ′ + 8 37		h m 19 48		° ′ +70 1		h m 19 49		° ′ −73 8		h m 19 50		° ′ + 6 10		h m 19 54		° ′ +19 14	
	s		″		s		″		s		″		s		″		s		″	
Jan. 1.1	18.33	.07	34.8	1.7	25.47	.13	71.9	3.4	58.05	.13	74.8	2.9	48.33	.06	40.0	1.6	40.35	.04	37.4	2.2
11.0	18.40	.10	33.1	1.7	25.34	.02	68.5	3.5	58.18	.27	71.9	3.0	48.39	.10	38.4	1.5	40.39	.09	35.2	2.2
21.0	18.50	.14	31.4	1.6	25.32	.11	65.0	3.5	58.45	.39	68.9	2.9	48.49	.13	36.9	1.5	40.48	.12	33.0	2.1
31.0	18.64	.17	29.8	1.5	25.43	.22	61.5	3.4	58.84	.51	66.0	2.8	48.62	.17	35.4	1.3	40.60	.15	30.9	2.0
Feb. 9.9	18.81	.20	28.3	1.2	25.65	.33	58.1	3.1	59.35	.62	63.2	2.6	48.79	.19	34.1	1.2	40.75	.19	28.9	1.8
19.9	19.01	.22	27.1	0.9	25.98	.43	55.0	2.7	59.97	.70	60.6	2.4	48.98	.22	32.9	0.8	40.94	.21	27.1	1.4
Mar. 1.9	19.23	.24	26.2	0.7	26.41	.51	52.3	2.2	60.67	.78	58.2	2.1	49.20	.24	32.1	0.6	41.15	.24	25.7	1.0
11.9	19.47	.26	25.5	0.2	26.92	.58	50.1	1.6	61.45	.85	56.1	1.8	49.44	.26	31.5	0.2	41.39	.26	24.7	0.6
21.8	19.73	.28	25.3	0.1	27.50	.63	48.5	1.0	62.30	.89	54.3	1.4	49.70	.27	31.3	0.1	41.65	.29	24.1	0.2
31.8	20.01	.29	25.4	0.5	28.13	.66	47.5	0.4	63.19	.92	52.9	1.1	49.97	.29	31.4	0.5	41.94	.29	23.9	0.3
Apr. 10.8	20.30	.30	25.9	0.8	28.79	.67	47.1	0.3	64.11	.94	51.8	0.6	50.26	.29	31.9	0.8	42.23	.30	24.2	0.7
20.8	20.60	.30	26.7	1.1	29.46	.66	47.4	0.9	65.05	.93	51.2	0.2	50.55	.30	32.7	1.2	42.53	.31	24.9	1.2
30.7	20.90	.29	27.8	1.5	30.12	.62	48.3	1.5	65.98	.92	51.0	0.2	50.85	.30	33.9	1.4	42.84	.30	26.1	1.5
May 10.7	21.19	.29	29.3	1.7	30.74	.58	49.8	2.1	66.90	.88	51.2	0.6	51.15	.29	35.3	1.6	43.14	.29	27.6	1.9
20.7	21.48	.27	31.0	1.8	31.32	.50	51.9	2.5	67.78	.82	51.8	1.0	51.44	.27	36.9	1.8	43.43	.27	29.5	2.1
30.6	21.75	.25	32.8	2.0	31.82	.43	54.4	2.9	68.60	.75	52.8	1.4	51.71	.25	38.7	1.8	43.70	.26	31.6	2.3
June 9.6	22.00	.22	34.8	2.0	32.25	.33	57.3	3.1	69.35	.66	54.2	1.8	51.96	.23	40.5	1.9	43.96	.22	33.9	2.4
19.6	22.22	.18	36.8	2.0	32.58	.23	60.4	3.4	70.01	.56	56.0	2.1	52.19	.19	42.4	1.9	44.18	.18	36.3	2.5
29.6	22.40	.15	38.8	1.9	32.81	.12	63.8	3.5	70.57	.43	58.1	2.3	52.38	.15	44.3	1.8	44.36	.15	38.8	2.4
July 9.5	22.55	.11	40.7	1.9	32.93	.01	67.3	3.5	71.00	.31	60.4	2.5	52.53	.11	46.1	1.7	44.51	.11	41.2	2.4
19.5	22.66	.06	42.6	1.7	32.94	.10	70.8	3.5	71.31	.16	62.9	2.7	52.64	.07	47.8	1.5	44.62	.06	43.6	2.2
29.5	22.72	.02	44.3	1.5	32.84	.21	74.3	3.3	71.47	.02	65.6	2.6	52.71	.03	49.3	1.4	44.68	.02	45.8	2.0
Aug. 8.5	22.74	.02	45.8	1.3	32.63	.31	77.6	3.1	71.49	.12	68.2	2.6	52.74	.02	50.7	1.2	44.70	.03	47.8	1.9
18.4	22.72	.06	47.1	1.1	32.32	.40	80.7	2.8	71.37	.25	70.8	2.5	52.72	.06	51.9	1.0	44.67	.07	49.7	1.6
28.4	22.66	.10	48.2	0.8	31.92	.48	83.5	2.5	71.12	.37	73.3	2.2	52.66	.10	52.9	0.7	44.60	.11	51.3	1.3
Sept. 7.4	22.56	.13	49.0	0.6	31.44	.56	86.0	2.1	70.75	.48	75.5	1.8	52.56	.12	53.6	0.5	44.49	.14	52.6	1.0
17.3	22.43	.15	49.6	0.4	30.88	.61	88.1	1.6	70.27	.56	77.3	1.5	52.44	.15	54.1	0.3	44.35	.16	53.6	0.7
27.3	22.28	.16	50.0	0.1	30.27	.65	89.7	1.1	69.71	.61	78.8	1.0	52.29	.16	54.4	0.1	44.19	.18	54.3	0.3
Oct. 7.3	22.12	.17	50.1	0.1	29.62	.68	90.8	0.6	69.10	.65	79.8	0.5	52.13	.16	54.5	0.2	44.01	.18	54.6	0.1
17.3	21.95	.17	50.0	0.4	28.94	.67	91.4	0.1	68.45	.64	80.3	0.1	51.97	.17	54.3	0.4	43.83	.18	54.7	0.3
27.2	21.78	.15	49.6	0.6	28.27	.66	91.5	0.5	67.81	.60	80.2	0.6	51.80	.15	53.9	0.6	43.65	.17	54.4	0.7
Nov. 6.2	21.63	.13	49.0	0.8	27.61	.63	91.0	1.0	67.21	.54	79.6	1.1	51.65	.13	53.3	0.8	43.48	.15	53.7	1.0
16.2	21.50	.10	48.2	1.1	26.98	.57	90.0	1.6	66.67	.46	78.5	1.6	51.52	.09	52.5	1.0	43.33	.12	52.7	1.2
26.2	21.40	.06	47.1	1.3	26.41	.50	88.4	2.1	66.21	.35	76.9	2.0	51.43	.07	51.5	1.2	43.21	.09	51.5	1.6
Dec. 6.1	21.34	.03	45.8	1.4	25.91	.42	86.3	2.6	65.86	.22	74.9	2.4	51.36	.04	50.3	1.4	43.12	.05	49.9	1.8
16.1	21.31	.00	44.4	1.6	25.49	.31	83.7	3.0	65.64	.09	72.5	2.7	51.32	.01	48.9	1.4	43.07	.02	48.1	2.0
26.1	21.31	.05	42.8	1.7	25.18	.21	80.7	3.2	65.55	.05	69.8	2.8	51.33	.05	47.5	1.6	43.05	.03	46.1	2.1
36.0	21.36		41.1		24.97		77.5		65.60		67.0		51.38		45.9		43.08		44.0	

[CONSTANTS OF STRUVE AND PETERS.]

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	c Sagittarii.				τ Aquilæ.				θ Aquilæ.				31 Cygni.				κ Cephei (pr.).			
	Right Ascension.		Declination *South.*		Right Ascension.		Declination *North.*		Right Ascension.		Declination *South.*		Right Ascension.		Declination *North.*		Right Ascension.		Declination *North.*	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	19 57		−27 57		19 59		− 7 1		20 6		− 1 5		20 10		+46 27		20 11		−77 25	
	s		″		s		″		s		″		s		″		s		″	
Jan. 1.1	1.20	.08	56.4	0.5	39.43	.06	10.8	1.6	34.32	.05	36.2	1.1	43.55	.02	54.8	3.1	53.06	0.38	79.3	3.2
11.0	1.28	.12	55.9	0.6	39.49	.09	9.2	1.6	34.37	.09	37.3	1.1	43.53	.03	51.7	3.1	52.68	0.19	76.1	3.4
21.0	1.40	.16	55.3	0.6	39.58	.12	7.6	1.5	34.46	.13	38.4	1.0	43.56	.08	48.6	3.2	52.49	0.01	72.7	3.5
31.0	1.56	.20	54.7	0.7	39.70	.16	6.1	1.3	34.59	.15	39.4	0.9	43.64	.13	45.4	3.0	52.48	0.19	69.2	3.4
Feb. 10.0	1.76	.22	54.0	0.8	39.86	.18	4.8	1.1	34.74	.18	40.3	0.7	43.77	.19	42.4	2.8	52.67	0.37	65.8	3.2
19.9	1.98	.25	53.2	0.8	40.04	.21	3.7	0.9	34.92	.21	41.0	0.5	43.96	.23	39.6	2.4	53.04	0.55	62.6	2.9
Mar. 1.9	2.23	.28	52.4	0.8	40.25	.23	2.8	0.6	35.13	.23	41.5	0.2	44.19	.27	37.2	2.0	53.59	0.69	59.7	2.4
11.9	2.51	.30	51.6	0.9	40.48	.26	2.2	0.2	35.36	.26	41.7	0.1	44.46	.31	35.2	1.5	54.28	0.82	57.3	1.9
21.8	2.81	.32	50.7	1.0	40.74	.27	2.0	0.1	35.62	.27	41.6	0.3	44.77	.34	33.7	0.8	55.10	0.91	55.4	1.4
31.8	3.13	.33	49.7	0.9	41.01	.29	2.1	0.5	35.89	.28	41.3	0.7	45.11	.36	32.9	0.3	56.01	0.97	54.0	0.7
Apr. 10.8	3.46	.34	48.8	1.0	41.30	.29	2.6	0.8	36.17	.30	40.6	0.9	45.47	.37	32.6	0.3	56.98	1.00	53.3	0.1
20.8	3.80	.34	47.8	0.9	41.59	.30	3.4	1.2	36.47	.30	39.7	1.1	45.84	.38	32.9	0.9	57.98	1.00	53.2	0.5
30.7	4.14	.34	46.9	0.9	41.89	.30	4.6	1.4	36.77	.30	38.6	1.3	46.22	.37	33.8	1.5	58.98	0.96	53.7	1.1
May 10.7	4.48	.34	46.0	0.8	42.19	.29	6.0	1.6	37.07	.30	37.3	1.5	46.59	.35	35.3	2.0	59.94	0.89	54.8	1.7
20.7	4.82	.32	45.2	0.6	42.48	.28	7.6	1.8	37.37	.28	35.8	1.6	46.94	.33	37.3	2.4	60.83	0.79	56.5	2.3
30.7	5.14	.30	44.6	0.5	42.76	.25	9.4	1.9	37.65	.27	34.2	1.7	47.27	.30	39.7	2.8	61.62	0.68	58.8	2.6
June 9.6	5.44	.27	44.1	0.3	43.01	.23	11.3	2.0	37.92	.24	32.5	1.6	47.57	.26	42.5	3.0	62.30	0.54	61.4	3.0
19.6	5.71	.24	43.8	0.1	43.24	.20	13.3	2.0	38.16	.21	30.9	1.6	47.83	.21	45.5	3.2	62.84	0.38	64.4	3.2
29.6	5.95	.20	43.7	0.0	43.44	.16	15.3	1.9	38.37	.17	29.3	1.5	48.04	.16	48.7	3.3	63.22	0.22	67.6	3.4
July 9.5	6.15	.15	43.7	0.2	43.60	.12	17.2	1.8	38.54	.13	27.8	1.4	48.20	.11	52.0	3.3	63.44	0.06	71.0	3.5
19.5	6.30	.10	43.9	0.4	43.72	.08	19.0	1.6	38.67	.09	26.4	1.2	48.31	.04	55.3	3.2	63.50	0.12	74.5	3.5
29.5	6.40	.05	44.3	0.5	43.80	.03	20.6	1.4	38.76	.05	25.2	1.0	48.35	.02	58.5	3.1	63.38	0.28	78.0	3.5
Aug. 8.5	6.45	.00	44.8	0.6	43.83	.01	22.0	1.3	38.81	.00	24.2	0.9	48.33	.07	61.6	2.9	63.10	0.44	81.5	3.3
18.4	6.45	.05	45.4	0.7	43.82	.05	23.3	1.1	38.81	.04	23.3	0.6	48.26	.12	64.5	2.7	62.66	0.59	84.8	3.0
28.4	6.40	.09	46.1	0.8	43.77	.09	24.4	0.8	38.77	.08	22.7	0.5	48.14	.18	67.2	2.3	62.07	0.73	87.8	2.8
Sept. 7.4	6.31	.12	46.9	0.7	43.68	.12	25.2	0.6	38.69	.11	22.2	0.3	47.96	.21	69.5	1.9	61.34	0.84	90.6	2.5
17.4	6.19	.16	47.6	0.6	43.56	.14	25.8	0.3	38.58	.14	21.9	0.1	47.75	.25	71.4	1.6	60.50	0.94	93.1	2.0
27.3	6.03	.17	48.2	0.6	43.42	.16	26.1	0.1	38.44	.15	21.8	0.0	47.50	.27	73.0	1.1	59.56	1.02	95.1	1.6
Oct. 7.3	5.86	.18	48.8	0.5	43.26	.17	26.2	0.1	38.29	.16	21.8	0.2	47.23	.28	74.1	0.6	58.54	1.07	96.7	1.0
17.3	5.68	.17	49.3	0.4	43.09	.16	26.1	0.3	38.13	.15	22.0	0.4	46.95	.29	74.7	0.1	57.47	1.09	97.7	0.6
27.2	5.51	.16	49.7	0.2	42.93	.15	25.8	0.6	37.98	.14	22.4	0.5	46.66	.28	74.8	0.4	56.38	1.09	98.3	0.0
Nov. 6.2	5.35	.14	49.9	0.1	42.78	.13	25.2	0.8	37.84	.13	22.9	0.6	46.38	.26	74.4	0.9	55.29	1.06	98.3	0.6
16.2	5.21	.10	50.0	0.0	42.65	.11	24.4	0.9	37.71	.10	23.5	0.8	46.12	.23	73.5	1.4	54.23	0.99	97.7	1.2
26.2	5.11	.07	50.0	0.2	42.54	.07	23.5	1.2	37.61	.07	24.3	0.9	45.89	.20	72.1	1.9	53.24	0.91	96.5	1.7
Dec. 6.1	5.04	.03	49.8	0.3	42.47	.04	22.3	1.4	37.54	.04	25.2	1.0	45.69	.15	70.2	2.3	52.33	0.80	94.8	2.2
16.1	5.01	.02	49.5	0.4	42.43	.00	20.9	1.4	37.50	.00	26.2	1.0	45.54	.11	67.9	2.6	51.53	0.65	92.6	2.6
26.1	5.03	.06	49.1	0.5	42.43	.03	19.5	1.5	37.50	.03	27.2	1.1	45.43	.05	65.3	2.9	50.88	0.49	90.0	3.0
36.1	5.09		48.6		42.46		18.0		37.53		28.3		45.38		62.4		50.39		87.0	

(CONSTANTS OF STRUVE AND PETERS.)

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α^2 Capricorni.				α Pavonis.				γ Cygni.				π Capricorni.				ϵ Delphini.			
	Right Ascension.		Declination *South.*		Right Ascension.		Declination *South.*		Right Ascension.		Declination *North.*		Right Ascension.		Declination *South.*		Right Ascension.		Declination *North.*	
	h m 20 12		° ′ −12 49		h m 20 18		° ′ −57 1		h m 20 18		° ′ +39 57		h m 20 22		° ′ −18 30		h m 20 28		° ′ +10 59	
	s		″		s		″		s		″		s		″		s		″	
Jan. 1.1	58.02	.06	45.9	0.4	23.39	.06	50.4	2.1	55.39	.01	54.3	2.9	4.40	.05	46.0	0.0	49.77	.02	32.5	1.7
11.0	58.08	.10	46.3	0.3	23.45	.13	48.3	2.3	55.38	.03	51.4	2.9	4.45	.09	46.0	0.0	49.79	.06	30.8	1.7
21.0	58.18	.12	46.6	0.3	23.58	.19	46.0	2.4	55.41	.08	48.5	3.0	4.54	.12	46.0	0.2	49.85	.09	29.1	1.6
31.0	58.30	.16	46.9	0.2	23.77	.25	43.6	2.3	55.49	.12	45.5	2.8	4.66	.16	45.8	0.2	49.94	.12	27.5	1.5
Feb. 10.0	58.46	.19	47.1	0.0	24.02	.31	41.3	2.4	55.61	.17	42.7	2.6	4.82	.18	45.6	0.3	50.06	.16	26.0	1.3
19.9	58.65	.21	47.1	0.2	24.33	.36	38.9	2.2	55.78	.21	40.1	2.3	5.00	.21	45.3	0.5	50.22	.18	24.7	1.0
Mar. 1.9	58.86	.24	46.9	0.3	24.69	.40	36.7	2.1	55.99	.24	37.8	1.8	5.21	.24	44.8	0.6	50.40	.22	23.7	0.8
11.9	59.10	.26	46.6	0.5	25.09	.44	34.6	1.9	56.23	.28	36.0	1.3	5.45	.26	44.2	0.8	50.62	.23	22.9	0.4
21.9	59.36	.28	46.1	0.7	25.53	.47	32.7	1.7	56.51	.31	34.7	0.8	5.71	.29	43.4	0.9	50.85	.26	22.5	0.0
31.8	59.64	.29	45.4	0.9	26.00	.50	31.0	1.4	56.82	.33	33.9	0.2	6.00	.30	42.5	1.0	51.11	.28	22.5	0.4
Apr. 10.8	59.93	.31	44.5	1.0	26.50	.51	29.6	1.2	57.15	.34	33.7	0.3	6.30	.31	41.5	1.1	51.39	.29	22.9	0.8
20.8	60.24	.31	43.5	1.1	27.01	.53	28.4	0.8	57.49	.35	34.0	0.9	6.61	.32	40.4	1.1	51.68	.30	23.7	1.1
30.7	60.55	.31	42.4	1.2	27.54	.53	27.6	0.6	57.84	.35	34.9	1.5	6.93	.32	39.3	1.2	51.98	.30	24.8	1.4
May 10.7	60.86	.31	41.2	1.3	28.07	.52	27.0	0.2	58.19	.34	36.4	1.9	7.25	.32	38.1	1.2	52.28	.30	26.2	1.7
20.7	61.17	.30	39.9	1.2	28.59	.49	26.8	0.2	58.53	.32	38.3	2.3	7.57	.31	36.9	1.2	52.58	.29	27.9	1.9
30.7	61.47	.28	38.7	1.3	29.08	.47	27.0	0.5	58.85	.29	40.6	2.6	7.88	.30	35.7	1.0	52.87	.28	29.8	2.1
June 9.6	61.75	.26	37.4	1.1	29.55	.43	27.5	0.9	59.14	.25	43.2	2.9	8.18	.27	34.7	0.9	53.15	.25	31.9	2.1
19.6	62.01	.23	36.3	1.0	29.98	.37	28.4	1.2	59.39	.22	46.1	3.1	8.45	.24	33.8	0.8	53.40	.22	34.0	2.2
29.6	62.24	.19	35.3	0.9	30.35	.32	29.6	1.4	59.61	.17	49.2	3.2	8.69	.21	33.0	0.6	53.62	.18	36.2	2.2
July 9.6	62.43	.15	34.4	0.7	30.67	.24	31.0	1.7	59.78	.11	52.4	3.1	8.90	.16	32.4	0.5	53.80	.15	38.4	2.0
19.5	62.58	.10	33.7	0.6	30.91	.17	32.7	1.9	59.89	.07	55.5	3.1	9.06	.12	31.9	0.2	53.95	.10	40.4	1.9
29.5	62.68	.06	33.1	0.4	31.08	.09	34.6	2.0	59.96	.01	58.6	3.0	9.18	.07	31.7	0.1	54.05	.05	42.3	1.8
Aug. 8.5	62.74	.01	32.7	0.2	31.17	.01	36.6	2.1	59.97	.04	61.6	2.7	9.25	.02	31.6	0.1	54.10	.01	44.1	1.6
18.4	62.75	.03	32.5	0.1	31.18	.06	38.7	2.1	59.93	.10	64.3	2.5	9.27	.02	31.7	0.2	54.11	.03	45.7	1.3
28.4	62.72	.07	32.4	0.1	31.12	.14	40.8	1.9	59.83	.14	66.8	2.2	9.25	.06	31.9	0.4	54.08	.07	47.0	1.1
Sept. 7.4	62.65	.10	32.5	0.2	30.98	.20	42.7	1.8	59.69	.17	69.0	1.9	9.19	.10	32.3	0.4	54.01	.10	48.1	0.9
17.4	62.55	.13	32.7	0.3	30.78	.24	44.5	1.5	59.52	.21	70.9	1.5	9.09	.13	32.7	0.5	53.91	.13	49.0	0.6
27.3	62.42	.15	33.0	0.3	30.54	.29	46.0	1.2	59.31	.23	72.4	1.0	8.96	.15	33.2	0.5	53.78	.15	49.6	0.3
Oct. 7.3	62.27	.16	33.3	0.4	30.25	.31	47.2	0.9	59.08	.24	73.4	0.6	8.81	.16	33.7	0.5	53.63	.16	49.9	0.1
17.3	62.11	.16	33.7	0.4	29.94	.31	48.1	0.4	58.84	.24	74.0	0.1	8.65	.16	34.2	0.4	53.47	.16	50.0	0.2
27.3	61.95	.15	34.1	0.4	29.63	.30	48.5	0.0	58.60	.24	74.1	0.3	8.49	.15	34.6	0.5	53.31	.16	49.8	0.5
Nov. 6.2	61.80	.12	34.5	0.4	29.33	.27	48.5	0.5	58.36	.22	73.8	0.8	8.34	.13	35.1	0.3	53.15	.14	49.3	0.7
16.2	61.68	.10	34.9	0.5	29.06	.23	48.0	0.8	58.14	.20	73.0	1.3	8.21	.11	35.4	0.3	53.01	.12	48.6	0.9
26.2	61.58	.07	35.4	0.4	28.83	.18	47.2	1.2	57.94	.17	71.7	1.8	8.10	.08	35.7	0.3	52.89	.09	47.7	1.2
Dec. 6.1	61.51	.04	35.8	0.5	28.65	.12	46.0	1.6	57.77	.13	69.9	2.1	8.02	.05	36.0	0.2	52.80	.07	46.5	1.4
16.1	61.47	.00	36.3	0.4	28.53	.05	44.4	1.9	57.64	.09	67.8	2.5	7.97	.00	36.2	0.1	52.73	.03	45.1	1.5
26.1	61.47	.04	36.7	0.4	28.48	.02	42.5	2.1	57.55	.04	65.3	2.7	7.97	.03	36.3	0.1	52.70	.01	43.6	1.6
36.1	61.51		37.1		28.50		40.4		57.51		62.6		8.00		36.4		52.71		42.0	

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	Groombridge 3241.				α Delphini.				β Pavonis.				α Cygni.				ψ Capricorni.			
	Right Ascension.		Declination *North.*		Right Ascension.		Declination *North.*		Right Ascension.		Declination *South.*		Right Ascension.		Declination *North.*		Right Ascension.		Declination *South.*	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	20 30		+72 13		20 35		+15 35		20 36		−66 31		20 38		+44 56		20 40		−25 35	
	s		″		s		″		s		″		s		″		s		″	
Jan. 1.1	20.51	.29	28.5	3.1	22.54	.01	23.6	1.9	41.38	.00	65.6	2.6	17.40	.05	78.7	2.8	40.13	.03	63.9	0.4
11.1	20.22	.16	25.4	3.3	22.55	.05	21.7	1.9	41.38	.09	63.0	2.8	17.35	.01	75.9	3.0	40.16	.07	63.5	0.5
21.0	20.06	.03	22.1	3.5	22.60	.08	19.8	1.9	41.47	.19	60.2	2.8	17.34	.05	72.9	3.1	40.23	.11	63.0	0.6
31.0	20.03	.10	18.6	3.4	22.68	.11	17.9	1.7	41.66	.28	57.4	2.9	17.39	.09	69.8	3.0	40.34	.14	62.4	0.7
Feb. 10.0	20.13	.24	15.2	3.2	22.79	.15	16.2	1.5	41.94	.35	54.5	2.8	17.48	.15	66.8	2.7	40.48	.18	61.7	0.9
19.9	20.37	.36	12.0	3.0	22.94	.18	14.7	1.3	42.29	.43	51.7	2.7	17.63	.19	64.1	2.5	40.66	.20	60.8	0.9
Mar. 1.9	20.73	.47	9.0	2.6	23.12	.21	13.4	1.0	42.72	.50	49.0	2.6	17.82	.24	61.6	2.1	40.86	.24	59.9	1.0
11.9	21.20	.56	6.4	2.1	23.33	.23	12.4	0.5	43.22	.55	46.4	2.3	18.06	.28	59.5	1.6	41.10	.26	58.9	1.2
21.9	21.76	.64	4.3	1.5	23.56	.26	11.9	0.2	43.77	.60	44.1	2.0	18.34	.32	57.9	1.1	41.36	.28	57.7	1.2
31.8	22.40	.70	2.8	0.9	23.82	.27	11.7	0.3	44.37	.64	42.1	1.8	18.66	.34	56.8	0.4	41.64	.31	56.5	1.2
Apr. 10.8	23.10	.72	1.9	0.3	24.09	.30	12.0	0.6	45.01	.67	40.3	1.4	19.00	.36	56.4	0.1	41.95	.32	55.3	1.3
20.8	23.82	.74	1.6	0.4	24.39	.30	12.6	1.1	45.68	.69	38.9	1.0	19.36	.37	56.5	0.7	42.27	.33	54.0	1.3
30.8	24.56	.73	2.0	1.0	24.69	.31	13.7	1.4	46.37	.69	37.9	0.6	19.73	.37	57.2	1.2	42.60	.34	52.7	1.3
May 10.7	25.29	.68	3.0	1.6	25.00	.30	15.1	1.7	47.06	.69	37.3	0.2	20.10	.36	58.4	1.8	42.94	.34	51.4	1.1
20.7	25.97	.63	4.6	2.1	25.30	.29	16.8	2.0	47.75	.66	37.1	0.2	20.46	.35	60.2	2.2	43.28	.34	50.3	1.1
30.7	26.60	.56	6.7	2.6	25.59	.28	18.8	2.2	48.41	.63	37.3	0.6	20.81	.32	62.4	2.6	43.62	.32	49.2	0.9
June 9.6	27.16	.46	9.3	2.9	25.87	.25	21.0	2.3	49.04	.57	37.9	1.0	21.13	.28	65.0	2.9	43.94	.29	48.3	0.7
19.6	27.62	.36	12.2	3.2	26.12	.23	23.3	2.4	49.61	.51	38.9	1.4	21.41	.24	67.9	3.1	44.23	.27	47.6	0.5
29.6	27.98	.25	15.4	3.4	26.35	.19	25.7	2.3	50.12	.43	40.3	1.8	21.65	.20	71.0	3.2	44.50	.23	47.1	0.3
July 9.6	28.23	.13	18.8	3.6	26.54	.15	28.0	2.3	50.55	.34	42.1	2.0	21.85	.14	74.2	3.3	44.73	.19	46.8	0.1
19.5	28.36	.01	22.4	3.6	26.69	.10	30.3	2.2	50.89	.25	44.1	2.2	21.99	.08	77.5	3.3	44.92	.14	46.7	0.1
29.5	28.37	.11	26.0	3.5	26.79	.06	32.5	2.0	51.14	.14	46.3	2.4	22.07	.03	80.8	3.2	45.06	.10	46.8	0.3
Aug. 8.5	28.26	.23	29.5	3.4	26.85	.01	34.5	1.8	51.28	.04	48.7	2.5	22.10	.03	84.0	3.0	45.16	.04	47.1	0.5
18.5	28.03	.35	32.9	3.2	26.86	.03	36.3	1.6	51.32	.07	51.2	2.5	22.07	.09	87.0	2.8	45.20	.00	47.6	0.6
28.4	27.68	.44	36.1	3.0	26.83	.07	37.9	1.3	51.25	.17	53.7	2.3	21.98	.13	89.8	2.5	45.20	.05	48.2	0.7
Sept. 7.4	27.24	.54	39.1	2.6	26.76	.10	39.2	1.1	51.08	.26	56.0	2.1	21.85	.18	92.3	2.1	45.15	.09	48.9	0.7
17.4	26.70	.61	41.7	2.2	26.66	.13	40.3	0.8	50.82	.33	58.1	1.9	21.67	.21	94.4	1.8	45.06	.12	49.6	0.8
27.3	26.09	.68	43.9	1.8	26.53	.15	41.1	0.5	50.49	.39	60.0	1.5	21.46	.24	96.2	1.4	44.94	.15	50.4	0.8
Oct. 7.3	25.41	.71	45.7	1.3	26.38	.17	41.6	0.2	50.10	.43	61.5	1.0	21.22	.26	97.6	0.9	44.79	.16	51.2	0.7
17.3	24.70	.74	47.0	0.7	26.21	.17	41.8	0.1	49.67	.45	62.5	0.6	20.96	.27	98.5	0.4	44.63	.17	51.9	0.6
27.3	23.96	.75	47.7	0.3	26.04	.16	41.7	0.4	49.22	.44	63.1	0.1	20.69	.26	98.9	0.1	44.46	.16	52.5	0.5
Nov. 6.2	23.21	.73	48.0	0.4	25.88	.15	41.3	0.7	48.78	.41	63.2	0.5	20.43	.26	98.8	0.5	44.30	.15	53.0	0.3
16.2	22.48	.69	47.6	1.0	25.73	.13	40.6	0.9	48.37	.37	62.7	0.9	20.17	.23	98.3	1.1	44.15	.12	53.3	0.2
26.2	21.79	.64	46.6	1.5	25.60	.10	39.7	1.2	48.00	.30	61.8	1.4	19.94	.20	97.2	1.6	44.03	.09	53.5	0.0
Dec. 6.2	21.15	.56	45.1	2.0	25.50	.08	38.5	1.5	47.70	.23	60.4	1.8	19.74	.17	95.6	2.0	43.94	.06	53.5	0.1
16.1	20.59	.47	43.1	2.5	25.42	.04	37.0	1.7	47.47	.14	58.6	2.2	19.57	.13	93.6	2.3	43.88	.03	53.4	0.2
26.1	20.12	.36	40.6	2.9	25.38	.00	35.3	1.8	47.33	.05	56.4	2.5	19.44	.08	91.3	2.7	43.85	.02	53.2	0.3
36.1	19.76		37.7		25.38		33.5		47.28		53.9		19.36		88.6		43.87		52.9	

(CONSTANTS OF STRUVE AND PETERS.)

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	ε Cygni.				μ Aquarii.				12 Year Cat. 1879.				ν Cygni.				61¹ Cygni.			
	Right Ascension.		Declination *North.*		Right Ascension.		Declination *South.*		Right Ascension.		Declination *North.*		Right Ascension.		Declination *North.*		Right Ascension.		Declination *North.*	
	h m 20 42		° ′ +33 37		h m 20 47		° ′ − 9 19		h m 20 51		° ′ +80 12		h m 20 53		° ′ +40 48		h m 21 2		° ′ +38 17	
	s		″		s		″		s		″		s		″		s		″	
Jan. 1.1	29.55	.03	44.3	2.5	42.57	.02	39.1	0.5	38.75	0.71	47.3	2.8	44.56	.06	60.4	2.7	46.80	.05	66.5	2.4
11.1	29.52	.01	41.8	2.7	42.59	.06	39.6	0.5	38.04	0.49	44.5	3.2	44.50	.01	57.7	2.8	46.75	.01	64.1	2.6
21.1	29.53	.06	39.1	2.6	42.65	.09	40.1	0.4	37.55	0.26	41.3	3.3	44.49	.03	54.9	2.9	46.74	.03	61.5	2.7
31.0	29.59	.10	36.5	2.6	42.74	.12	40.5	0.2	37.29	0.01	38.0	3.4	44.52	.08	52.0	2.8	46.77	.08	58.8	2.6
Feb. 10.0	29.69	.14	33.9	2.4	42.86	.15	40.7	0.1	37.28	0.24	34.6	3.3	44.60	.12	49.2	2.7	46.85	.13	56.2	2.5
20.0	29.83	.18	31.5	2.0	43.01	.18	40.8	0.1	37.52	0.48	31.3	3.1	44.72	.17	46.5	2.4	46.98	.16	53.7	2.2
Mar. 1.9	30.01	.21	29.5	1.7	43.19	.20	40.7	0.2	38.00	0.69	28.2	2.8	44.89	.22	44.1	2.0	47.14	.21	51.5	1.9
11.9	30.22	.25	27.8	1.3	43.39	.23	40.5	0.5	38.69	0.88	25.4	2.4	45.11	.25	42.1	1.5	47.35	.25	49.6	1.4
21.9	30.47	.28	26.5	0.7	43.62	.26	40.0	0.7	39.57	1.03	23.0	1.8	45.36	.29	40.6	1.1	47.60	.28	48.2	1.0
31.9	30.75	.30	25.8	0.3	43.88	.27	39.3	1.0	40.60	1.15	21.2	1.3	45.65	.31	39.5	0.5	47.88	.31	47.2	0.4
Apr. 10.8	31.05	.32	25.5	0.3	44.15	.30	38.3	1.1	41.75	1.23	19.9	0.6	45.96	.34	39.0	0.1	48.19	.34	46.8	0.2
20.8	31.37	.33	25.8	0.9	44.45	.30	37.2	1.2	42.98	1.26	19.3	0.0	46.30	.35	39.1	0.6	48.53	.35	47.0	0.7
30.8	31.70	.33	26.7	1.3	44.75	.31	36.0	1.4	44.24	1.24	19.3	0.6	46.65	.36	39.7	1.2	48.88	.35	47.7	1.2
May 10.7	32.03	.33	28.0	1.8	45.06	.32	34.6	1.5	45.48	1.20	19.9	1.2	47.01	.35	40.9	1.7	49.23	.36	48.9	1.7
20.7	32.36	.32	29.8	2.1	45.38	.31	33.1	1.5	46.68	1.11	21.1	1.8	47.36	.34	42.6	2.1	49.59	.35	50.6	2.1
30.7	32.68	.30	31.9	2.5	45.69	.29	31.6	1.5	47.79	0.98	22.9	2.2	47.70	.32	44.7	2.4	49.94	.33	52.7	2.5
June 9.7	32.98	.27	34.4	2.7	45.98	.27	30.1	1.5	48.77	0.83	25.1	2.7	48.02	.29	47.1	2.8	50.27	.30	55.2	2.8
19.6	33.25	.23	37.1	2.9	46.25	.25	28.6	1.3	49.60	0.66	27.8	3.0	48.31	.25	49.9	3.0	50.57	.27	58.0	3.1
29.6	33.48	.19	40.0	3.0	46.50	.22	27.3	1.2	50.26	0.46	30.8	3.3	48.56	.21	52.9	3.1	50.84	.23	61.1	3.1
July 9.6	33.67	.15	43.0	3.0	46.72	.18	26.1	1.0	50.72	0.26	34.1	3.4	48.77	.16	56.0	3.2	51.07	.18	64.2	3.2
19.6	33.82	.10	46.0	3.0	46.90	.13	25.1	0.9	50.98	0.06	37.5	3.6	48.93	.11	59.2	3.2	51.25	.13	67.4	3.2
29.5	33.92	.05	49.0	2.8	47.03	.09	24.2	0.7	51.04	0.16	41.1	3.6	49.04	.05	62.4	3.1	51.38	.08	70.6	3.2
Aug. 8.5	33.97	.00	51.8	2.7	47.12	.04	23.5	0.5	50.88	0.37	44.7	3.5	49.09	.00	65.5	3.0	51.46	.02	73.8	3.0
18.5	33.97	.05	54.5	2.4	47.16	.00	23.0	0.3	50.51	0.56	48.2	3.4	49.09	.05	68.5	2.7	51.48	.03	76.8	2.8
28.5	33.92	.09	56.9	2.2	47.16	.04	22.7	0.1	49.95	0.75	51.6	3.2	49.04	.10	71.2	2.5	51.45	.07	79.6	2.5
Sept. 7.4	33.83	.13	59.1	1.8	47.12	.08	22.6	0.0	49.20	0.92	54.8	2.9	48.94	.15	73.7	2.2	51.38	.12	82.1	2.2
17.4	33.70	.17	60.9	1.5	47.04	.11	22.6	0.2	48.28	1.06	57.7	2.5	48.79	.18	75.9	1.8	51.26	.15	84.3	1.9
27.4	33.53	.18	62.4	1.1	46.93	.13	22.8	0.3	47.22	1.19	60.2	2.2	48.61	.21	77.7	1.4	51.11	.18	86.2	1.5
Oct. 7.3	33.35	.21	63.5	0.7	46.80	.15	23.1	0.3	46.03	1.29	62.4	1.7	48.40	.22	79.1	1.0	50.93	.20	87.7	1.1
17.3	33.14	.21	64.2	0.3	46.65	.15	23.4	0.5	44.74	1.35	64.1	1.2	48.18	.24	80.1	0.5	50.73	.21	88.8	0.6
27.3	32.93	.20	64.5	0.2	46.50	.14	23.9	0.5	43.39	1.39	65.3	0.7	47.94	.23	80.6	0.0	50.52	.21	89.4	0.2
Nov. 6.3	32.73	.20	64.3	0.6	46.36	.14	24.4	0.5	42.00	1.38	66.0	0.1	47.71	.23	80.6	0.4	50.31	.21	89.6	0.3
16.2	32.53	.18	63.7	1.0	46.22	.11	24.9	0.5	40.62	1.35	66.1	0.5	47.48	.21	80.2	0.9	50.10	.19	89.3	0.7
26.2	32.35	.15	62.7	1.5	46.11	.09	25.4	0.6	39.27	1.27	65.6	1.0	47.27	.19	79.3	1.4	49.91	.17	88.6	1.2
Dec. 6.2	32.20	.12	61.2	1.8	46.02	.06	26.0	0.6	38.00	1.16	64.6	1.7	47.08	.16	77.9	1.8	49.74	.14	87.4	1.6
16.1	32.08	.08	59.4	2.1	45.96	.03	26.6	0.6	36.84	1.02	62.9	2.1	46.92	.12	76.1	2.2	49.60	.11	85.8	2.0
26.1	32.00	.05	57.3	2.4	45.93	.01	27.2	0.5	35.82	0.84	60.8	2.6	46.80	.08	73.9	2.5	49.49	.07	83.8	2.2
36.1	31.95		54.9		45.94		27.7		34.98		58.2		46.72		71.4		49.42		81.6	

(CONSTANTS OF STRUVE AND PETERS.)

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	ζ Cygni.				τ Cygni.				α Cephei.				ι Pegasi.				ζ Capricorni.			
	Right Ascension.		Declination North.		Right Ascension.		Declination North.		Right Ascension.		Declination North.		Right Ascension.		Declination North.		Right Ascension.		Declination South.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	21 9		+29 50		21 11		+37 39		21 16		+62 11		21 17		+19 24		21 21		−22 48	
	s		″		s		″		s		″		s		″		s		″	
Jan. 1.1	1.66	.04	71.4	2.2	7.33	.07	25.1	2.4	21.78	.22	64.7	2.7	50.64	.03	50.9	1.9	26.20	.01	33.0	0.2
11.1	1.62	.01	69.2	2.4	7.26	.02	22.7	2.6	21.56	.15	62.0	3.0	50.61	.00	49.0	1.9	26.19	.03	32.8	0.4
21.1	1.61	.03	66.8	2.5	7.24	.02	20.1	2.7	21.41	.07	59.0	3.3	50.61	.04	47.1	1.9	26.22	.06	32.4	0.6
31.0	1.64	.07	64.3	2.3	7.26	.06	17.4	2.7	21.34	.01	55.7	3.3	50.65	.07	45.2	1.8	26.28	.10	31.8	0.6
Feb. 10.0	1.71	.11	62.0	2.2	7.32	.10	14.7	2.5	21.35	.10	52.4	3.2	50.72	.10	43.4	1.7	26.38	.13	31.2	0.8
20.0	1.82	.15	59.8	2.0	7.42	.15	12.2	2.3	21.45	.17	49.2	3.0	50.82	.14	41.7	1.4	26.51	.16	30.4	1.0
Mar. 2.0	1.97	.18	57.8	1.6	7.57	.19	9.9	1.9	21.62	.25	46.2	2.7	50.96	.17	40.3	1.2	26.67	.19	29.4	1.1
11.9	2.15	.22	56.2	1.2	7.76	.23	8.0	1.6	21.87	.33	43.5	2.3	51.13	.20	39.1	0.8	26.86	.22	28.3	1.3
21.9	2.37	.25	55.0	0.8	7.99	.27	6.4	1.0	22.20	.39	41.2	1.8	51.33	.23	38.3	0.4	27.08	.25	27.0	1.4
31.9	2.62	.28	54.2	0.3	8.26	.29	5.4	0.5	22.59	.44	39.4	1.2	51.56	.26	37.9	0.0	27.33	.27	25.6	1.4
Apr. 10.8	2.90	.30	53.9	0.2	8.55	.32	4.9	0.0	23.03	.48	38.2	0.6	51.82	.28	37.9	0.5	27.60	.30	24.2	1.6
20.8	3.20	.32	54.1	0.7	8.87	.34	4.9	0.5	23.51	.51	37.6	0.0	52.10	.30	38.4	0.9	27.90	.31	22.6	1.5
30.8	3.52	.33	54.8	1.2	9.21	.34	5.4	1.1	24.02	.52	37.6	0.6	52.40	.31	39.3	1.3	28.21	.33	21.1	1.6
May 10.8	3.85	.33	56.0	1.7	9.55	.35	6.5	1.6	24.54	.51	38.2	1.2	52.71	.32	40.6	1.6	28.54	.34	19.5	1.5
20.7	4.18	.32	57.7	2.0	9.90	.34	8.1	2.0	25.05	.50	39.4	1.8	53.03	.31	42.2	1.9	28.88	.34	18.0	1.4
30.7	4.50	.30	59.7	2.3	10.24	.33	10.1	2.4	25.55	.46	41.2	2.2	53.34	.30	44.1	2.2	29.22	.33	16.6	1.3
June 9.7	4.80	.29	62.0	2.6	10.57	.30	12.5	2.7	26.01	.42	43.4	2.7	53.64	.28	46.3	2.4	29.55	.31	15.3	1.1
19.7	5.09	.25	64.6	2.7	10.87	.26	15.2	2.9	26.43	.36	46.1	3.0	53.92	.26	48.7	2.4	29.86	.29	14.2	0.9
29.6	5.34	.22	67.3	2.8	11.13	.23	18.1	3.0	26.79	.29	49.1	3.3	54.18	.22	51.1	2.5	30.15	.26	13.3	0.7
July 9.6	5.56	.18	70.1	2.9	11.36	.18	21.1	3.1	27.08	.22	52.4	3.5	54.40	.19	53.6	2.5	30.41	.22	12.6	0.5
19.6	5.74	.13	73.0	2.9	11.54	.13	24.2	3.2	27.30	.14	55.9	3.6	54.59	.14	56.1	2.5	30.63	.18	12.1	0.2
29.5	5.87	.08	75.9	2.7	11.67	.08	27.4	3.0	27.44	.06	59.5	3.6	54.73	.10	58.6	2.3	30.81	.13	11.9	0.1
Aug. 8.5	5.95	.03	78.6	2.6	11.75	.02	30.4	2.9	27.50	.01	63.1	3.5	54.83	.05	60.9	2.1	30.94	.08	12.0	0.2
18.5	5.98	.01	81.2	2.4	11.77	.02	33.3	2.8	27.49	.10	66.6	3.4	54.88	.01	63.0	2.0	31.02	.04	12.2	0.5
28.5	5.97	.06	83.6	2.1	11.75	.07	36.1	2.5	27.39	.18	70.0	3.3	54.89	.03	65.0	1.7	31.06	.01	12.7	0.5
Sept. 7.4	5.91	.10	85.7	1.9	11.68	.12	38.6	2.1	27.21	.24	73.3	2.9	54.86	.07	66.7	1.4	31.05	.05	13.2	0.7
17.4	5.81	.13	87.6	1.5	11.56	.15	40.7	1.9	26.97	.30	76.2	2.6	54.79	.11	68.1	1.2	31.00	.09	13.9	0.8
27.4	5.68	.16	89.1	1.2	11.41	.18	42.6	1.5	26.67	.35	78.8	2.2	54.68	.13	69.3	0.8	30.91	.12	14.7	0.8
Oct. 7.4	5.52	.17	90.3	0.8	11.23	.20	44.1	1.0	26.32	.39	81.0	1.7	54.55	.15	70.1	0.5	30.79	.14	15.5	0.8
17.3	5.35	.19	91.1	0.4	11.03	.21	45.1	0.7	25.93	.42	82.7	1.3	54.40	.15	70.6	0.3	30.65	.15	16.3	0.8
27.3	5.16	.19	91.5	0.0	10.82	.22	45.8	0.2	25.51	.43	84.0	0.8	54.25	.16	70.9	0.1	30.50	.15	17.1	0.6
Nov. 6.3	4.97	.18	91.5	0.4	10.60	.21	46.0	0.3	25.08	.44	84.8	0.1	54.09	.16	70.8	0.5	30.35	.15	17.7	0.6
16.2	4.79	.17	91.1	0.8	10.39	.20	45.7	0.7	24.64	.42	84.9	0.4	53.93	.14	70.3	0.7	30.20	.13	18.3	0.4
26.2	4.62	.15	90.3	1.1	10.19	.17	45.0	1.2	24.22	.40	84.5	1.0	53.79	.13	69.6	1.0	30.07	.11	18.7	0.3
Dec. 6.2	4.47	.12	89.2	1.6	10.02	.16	43.8	1.6	23.82	.36	83.5	1.5	53.66	.10	68.6	1.3	29.96	.08	19.0	0.1
16.2	4.35	.10	87.6	1.8	9.86	.12	42.2	1.9	23.46	.32	82.0	2.0	53.56	.08	67.3	1.5	29.88	.06	19.1	0.1
26.1	4.25	.06	85.8	2.1	9.74	.08	40.3	2.3	23.14	.25	80.0	2.5	53.48	.05	65.8	1.7	29.82	.02	19.0	0.1
36.1	4.19		83.7		9.66		38.0		22.89		77.5		53.43		64.1		29.80		18.9	

(CONSTANTS OF STRUVE AND PETERS.)

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	β Aquarii.				β Cephei (pr.).				ξ Aquarii.				74 Cygni.				λ¹ Octantis.			
	Right Ascension.		Declination *South.*		Right Ascension.		Declination *North.*		Right Ascension.		Declination *South.*		Right Ascension.		Declination *North.*		Right Ascension.		Declination *South.*	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	21 26		− 5 58		21 27		+70 9		21 32		− 8 15		21 33		+39 59		21 36		−83 7	
	s		″		s		″		s		″		s		″		s		″	
Jan. 1.1	44.10	.01	27.3	0.6	26.15	.38	46.9	2.6	52.48	.02	54.7	0.5	15.97	.10	78.1	2.3	51.97	0.70	97.2	2.9
11.1	44.09	.02	27.9	0.6	25.77	.27	44.3	3.0	52.46	.01	55.2	0.5	15.87	.05	75.8	2.6	51.27	0.40	94.3	3.3
21.1	44.11	.04	28.5	0.5	25.50	.17	41.3	3.2	52.47	.04	55.7	0.3	15.82	.02	73.2	2.7	50.87	0.09	91.0	3.5
31.0	44.15	.08	29.0	0.4	25.33	.06	38.1	3.3	52.51	.07	56.0	0.2	15.80	.03	70.5	2.7	50.78	0.21	87.5	3.6
Feb. 10.0	44.23	.11	29.4	0.2	25.27	.06	34.8	3.3	52.58	.11	56.2	0.0	15.83	.08	67.8	2.6	50.99	0.50	83.9	3.6
20.0	44.34	.14	29.6	0.0	25.33	.18	31.5	3.2	52.69	.13	56.2	0.1	15.91	.12	65.2	2.4	51.49	0.79	80.3	3.6
Mar. 2.0	44.48	.17	29.6	0.2	25.51	.29	28.3	2.9	52.82	.17	56.1	0.4	16.03	.17	62.8	2.1	52.28	1.06	76.7	3.4
11.9	44.65	.19	29.4	0.5	25.80	.40	25.4	2.5	52.99	.19	55.7	0.6	16.20	.21	60.7	1.7	53.34	1.29	73.3	3.2
21.9	44.84	.23	28.9	0.7	26.20	.49	22.9	2.1	53.18	.22	55.1	0.8	16.41	.25	59.0	1.3	54.63	1.50	70.1	2.9
31.9	45.07	.25	28.2	0.9	26.69	.56	20.8	1.5	53.40	.25	54.3	1.0	16.66	.29	57.7	0.7	56.13	1.69	67.2	2.6
Apr. 10.9	45.32	.27	27.3	1.2	27.25	.62	19.3	0.9	53.65	.27	53.3	1.3	16.95	.31	57.0	0.2	57.82	1.84	64.6	2.2
20.8	45.59	.29	26.1	1.4	27.87	.66	18.4	0.3	53.92	.30	52.0	1.4	17.26	.34	56.8	0.3	59.66	1.95	62.4	1.7
30.8	45.88	.31	24.7	1.5	28.53	.68	18.1	0.4	54.22	.30	50.6	1.5	17.60	.36	57.1	0.9	61.61	2.02	60.7	1.3
May 10.8	46.19	.31	23.2	1.6	29.21	.67	18.5	0.9	54.52	.32	49.1	1.7	17.96	.36	58.0	1.3	63.63	2.06	59.4	0.7
20.7	46.50	.32	21.6	1.7	29.88	.65	19.4	1.6	54.84	.32	47.4	1.6	18.32	.35	59.3	1.9	65.69	2.04	58.7	0.3
30.7	46.82	.31	19.9	1.7	30.53	.61	21.0	2.0	55.16	.31	45.8	1.8	18.67	.34	61.2	2.2	67.73	1.99	58.4	0.2
June 9.7	47.13	.29	18.2	1.7	31.14	.54	23.0	2.5	55.47	.29	44.0	1.6	19.01	.32	63.4	2.6	69.72	1.88	58.6	0.8
19.7	47.42	.27	16.5	1.7	31.68	.47	25.5	2.9	55.76	.28	42.4	1.6	19.33	.29	66.0	2.8	71.60	1.74	59.4	1.3
29.6	47.69	.24	14.8	1.5	32.15	.39	28.4	3.2	56.04	.25	40.8	1.4	19.62	.25	68.8	3.0	73.34	1.54	60.7	1.7
July 9.6	47.93	.20	13.3	1.3	32.54	.29	31.6	3.5	56.29	.21	39.4	1.3	19.87	.21	71.8	3.2	74.88	1.31	62.4	2.1
19.6	48.13	.17	12.0	1.2	32.83	.18	35.1	3.6	56.50	.17	38.1	1.0	20.08	.16	75.0	3.1	76.19	1.03	64.5	2.5
29.6	48.30	.12	10.8	1.0	33.01	.07	38.7	3.7	56.67	.13	37.1	0.9	20.24	.10	78.1	3.2	77.22	0.73	67.0	2.7
Aug. 8.5	48.42	.08	9.8	0.7	33.08	.03	42.4	3.6	56.80	.09	36.2	0.7	20.34	.05	81.3	3.0	77.95	0.40	69.7	2.9
18.5	48.50	.04	9.1	0.6	33.05	.13	46.0	3.6	56.89	.04	35.5	0.4	20.39	.00	84.3	2.9	78.35	0.07	72.6	3.0
28.5	48.54	.01	8.5	0.3	32.92	.24	49.6	3.4	56.93	.00	35.1	0.2	20.39	.05	87.2	2.7	78.42	0.26	75.6	2.9
Sept. 7.4	48.53	.05	8.2	0.2	32.68	.33	53.0	3.1	56.93	.04	34.9	0.0	20.34	.09	89.9	2.4	78.16	0.59	78.5	2.8
17.4	48.48	.08	8.0	0.0	32.35	.41	56.1	2.9	56.89	.08	34.9	0.1	20.25	.14	92.3	2.1	77.57	0.90	81.3	2.6
27.4	48.40	.11	8.0	0.2	31.94	.49	59.0	2.5	56.81	.10	35.0	0.2	20.11	.16	94.4	1.7	76.67	1.15	83.9	2.2
Oct. 7.4	48.29	.12	8.2	0.3	31.45	.54	61.5	2.1	56.71	.12	35.2	0.4	19.95	.19	96.1	1.4	75.52	1.37	86.1	1.7
17.3	48.17	.14	8.5	0.4	30.91	.59	63.6	1.5	56.59	.13	35.6	0.5	19.76	.21	97.5	0.9	74.15	1.53	87.8	1.3
27.3	48.03	.14	8.9	0.5	30.32	.62	65.1	1.1	56.46	.14	36.1	0.5	19.55	.22	98.4	0.4	72.62	1.62	89.1	0.6
Nov. 6.3	47.89	.13	9.4	0.5	29.70	.62	66.2	0.5	56.32	.14	36.6	0.6	19.33	.22	98.8	0.0	71.00	1.65	89.7	0.0
16.3	47.76	.12	9.9	0.6	29.08	.62	66.7	0.2	56.18	.12	37.2	0.6	19.11	.21	98.8	0.5	69.35	1.61	89.7	0.6
26.2	47.64	.11	10.5	0.7	28.46	.60	66.5	0.7	56.06	.10	37.8	0.6	18.90	.20	98.3	0.9	67.74	1.50	89.1	1.2
Dec. 6.2	47.53	.08	11.2	0.6	27.86	.56	65.8	1.3	55.96	.08	38.4	0.6	18.70	.17	97.4	1.4	66.24	1.33	87.9	1.8
16.2	47.45	.05	11.8	0.7	27.30	.50	64.5	1.8	55.88	.06	39.0	0.6	18.53	.14	96.0	1.8	64.91	1.12	86.1	2.3
26.1	47.40	.03	12.5	0.7	26.80	.42	62.7	2.3	55.82	.03	39.6	0.5	18.39	.12	94.2	2.1	63.79	0.87	83.8	2.7
36.1	47.37		13.2		26.38		60.4		55.79		40.1		18.27		92.1		62.92		81.1	

(CONSTANTS OF STRUVE AND PETERS.)

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	ε Pegasi.				11 Cephei.				π^2 Cygni.				μ Capricorni.				16 Pegasi.			
	Right Ascension.		Declination North.		Right Ascension.		Declination North.		Right Ascension.		Declination North.		Right Ascension.		Declination South.		Right Ascension.		Declination North.	
	h m 21 39		° ′ + 9 27		h m 21 40		° ′ +70 53		h m 21 43		° ′ +48 52		h m 21 48		° ′ −13 58		h m 21 48		° ′ +25 29	
	s		″		s		″		s		″		s		″		s		″	
Jan. 1.1	41.03	.03	21.9	1.3	32.23	.41	39.7	2.5	23.63	.14	82.0	2.3	18.14	.03	61.0	0.2	53.33	.07	47.6	1.9
11.1	41.00	.01	20.6	1.4	31.82	.32	37.2	2.8	23.49	.10	79.7	2.7	18.11	.00	61.2	0.1	53.26	.04	45.7	2.0
21.1	40.99	.03	19.2	1.3	31.50	.22	34.4	3.1	23.39	.05	77.0	2.9	18.11	.03	61.3	0.0	53.22	.00	43.7	2.1
31.1	41.02	.05	17.9	1.2	31.28	.09	31.3	3.3	23.34	.00	74.1	2.9	18.14	.06	61.3	0.2	53.22	.03	41.6	2.0
Feb. 10.0	41.07	.09	16.7	1.1	31.19	.02	28.0	3.3	23.34	.05	71.2	2.9	18.20	.09	61.1	0.4	53.25	.07	39.6	1.9
20.0	41.16	.11	15.6	0.9	31.21	.14	24.7	3.2	23.39	.11	68.3	2.8	18.29	.12	60.7	0.5	53.32	.10	37.7	1.8
Mar. 2.0	41.27	.15	14.7	0.6	31.35	.27	21.5	3.0	23.50	.17	65.5	2.4	18.41	.16	60.2	0.7	53.42	.14	35.9	1.5
11.9	41.42	.19	14.1	0.4	31.62	.38	18.5	2.6	23.67	.22	63.1	2.1	18.57	.18	59.5	1.0	53.56	.18	34.4	1.1
21.9	41.61	.21	13.7	0.0	32.00	.47	15.9	2.2	23.89	.27	61.0	1.6	18.75	.22	58.5	1.1	53.74	.21	33.3	0.7
31.9	41.82	.24	13.7	0.4	32.47	.56	13.7	1.6	24.16	.31	59.4	1.1	18.97	.24	57.4	1.3	53.95	.25	32.6	0.3
Apr. 10.9	42.06	.26	14.1	0.7	33.03	.63	12.1	1.1	24.47	.35	58.3	0.6	19.21	.27	56.1	1.4	54.20	.28	32.3	0.1
20.8	42.32	.29	14.8	1.1	33.66	.67	11.0	0.5	24.82	.38	57.7	0.0	19.48	.29	54.7	1.6	54.48	.29	32.4	0.6
30.8	42.61	.30	15.9	1.3	34.33	.70	10.5	0.2	25.20	.39	57.7	0.6	19.77	.31	53.1	1.7	54.77	.32	33.0	1.0
May 10.8	42.91	.31	17.2	1.7	35.03	.70	10.7	0.8	25.59	.40	58.3	1.2	20.08	.32	51.4	1.7	55.09	.32	34.0	1.5
20.7	43.22	.31	18.9	1.8	35.73	.68	11.5	1.4	25.99	.39	59.5	1.7	20.40	.33	49.7	1.7	55.41	.33	35.5	1.8
30.7	43.53	.30	20.7	2.0	36.41	.65	12.9	1.9	26.38	.39	61.2	2.1	20.73	.32	48.0	1.6	55.74	.32	37.3	2.2
June 9.7	43.83	.30	22.7	2.2	37.06	.58	14.8	2.4	26.77	.36	63.3	2.5	21.05	.31	46.4	1.6	56.06	.30	39.5	2.4
19.7	44.13	.27	24.9	2.1	37.64	.51	17.2	2.8	27.13	.32	65.8	2.8	21.36	.29	44.8	1.4	56.36	.28	41.9	2.5
29.6	44.40	.24	27.0	2.2	38.15	.43	20.0	3.1	27.45	.28	68.6	3.1	21.65	.26	43.4	1.2	56.64	.25	44.4	2.7
July 9.6	44.64	.21	29.2	2.1	38.58	.33	23.1	3.4	27.73	.23	71.7	3.3	21.91	.23	42.2	1.1	56.89	.21	47.1	2.7
19.6	44.85	.16	31.3	2.0	38.91	.23	26.5	3.6	27.96	.18	75.0	3.4	22.14	.20	41.1	0.8	57.10	.18	49.8	2.7
29.6	45.01	.13	33.3	1.9	39.14	.11	30.1	3.6	28.14	.12	78.4	3.4	22.34	.15	40.3	0.5	57.28	.13	52.5	2.6
Aug. 8.5	45.14	.08	35.2	1.7	39.25	.01	33.7	3.7	28.26	.05	81.8	3.4	22.49	.10	39.8	0.4	57.41	.08	55.1	2.5
18.5	45.22	.04	36.9	1.4	39.26	.10	37.4	3.6	28.31	.00	85.2	3.2	22.59	.06	39.4	0.1	57.49	.03	57.6	2.3
28.5	45.26	.01	38.3	1.3	39.16	.21	41.0	3.5	28.31	.06	88.4	3.0	22.65	.02	39.3	0.1	57.52	.00	59.9	2.1
Sept. 7.5	45.25	.04	39.6	1.0	38.95	.31	44.5	3.3	28.25	.11	91.4	2.8	22.67	.03	39.4	0.3	57.52	.05	62.0	1.8
17.4	45.21	.08	40.6	0.7	38.64	.40	47.8	3.0	28.14	.16	94.2	2.5	22.64	.06	39.7	0.4	57.47	.09	63.8	1.6
27.4	45.13	.10	41.3	0.5	38.24	.47	50.8	2.7	27.98	.19	96.7	2.1	22.58	.09	40.1	0.5	57.38	.11	65.4	1.3
Oct. 7.4	45.03	.12	41.8	0.3	37.77	.53	53.5	2.2	27.79	.23	98.8	1.7	22.49	.12	40.6	0.6	57.27	.14	66.7	0.9
17.3	44.91	.13	42.1	0.1	37.24	.59	55.7	1.8	27.56	.25	100.5	1.3	22.37	.13	41.2	0.6	57.13	.16	67.6	0.6
27.3	44.78	.14	42.2	0.2	36.65	.63	57.5	1.2	27.31	.26	101.8	0.7	22.24	.13	41.8	0.7	56.97	.16	68.2	0.3
Nov. 6.3	44.64	.14	42.0	0.4	36.02	.64	58.7	0.7	27.05	.27	102.5	0.3	22.11	.13	42.5	0.6	56.81	.16	68.5	0.1
16.3	44.50	.13	41.6	0.7	35.38	.64	59.4	0.1	26.78	.26	102.8	0.2	21.98	.13	43.1	0.6	56.65	.16	68.4	0.5
26.2	44.37	.12	40.9	0.8	34.74	.63	59.5	0.4	26.52	.25	102.6	0.8	21.85	.11	43.7	0.5	56.49	.14	67.9	0.9
Dec. 6.2	44.25	.10	40.1	1.0	34.11	.59	59.1	1.1	26.27	.23	101.8	1.3	21.74	.09	44.2	0.5	56.35	.13	67.0	1.1
16.2	44.15	.07	39.1	1.1	33.52	.54	58.0	1.7	26.04	.20	100.5	1.7	21.65	.07	44.7	0.3	56.22	.11	65.9	1.5
26.2	44.08	.05	38.0	1.3	32.98	.46	56.3	2.1	25.84	.17	98.8	2.2	21.58	.04	45.0	0.3	56.11	.08	64.4	1.7
36.1	44.03		36.7		32.52		54.2		25.67		96.6		21.54		45.3		56.03		62.7	

(CONSTANTS OF STRUVE AND PETERS.)

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	79 Draconis.				α Aquarii.				α Gruis.				π⁶ Pegasi.				θ Aquarii.			
	Right Ascension.		Declination North.		Right Ascension.		Declination South.		Right Ascension.		Declination South.		Right Ascension.		Declination North.		Right Ascension.		Declination South.	
	h m 21 51		° ′ +73 15		h m 22 1		° ′ − 0 45		h m 22 2		° ′ −47 23		h m 22 5		° ′ +32 43		h m 22 12		° ′ − 8 13	
	s		″		s		″		s		″		s		″		s		″	
Jan. 1.1	40.03		86.2		4.75		51.6		27.62		86.4		54.80		54.4		0.09		81.8	
11.1	39.51	.52	83.9	2.3	4.71	.04	52.4	0.8	27.54	.08	85.1	1.3	54.70	.10	52.5	1.9	0.04	.05	82.3	0.5
21.1	39.10	.41	81.2	2.7	4.70	.01	53.2	0.8	27.51	.03	83.4	1.7	54.63	.07	50.4	2.1	0.02	.02	82.7	0.4
31.1	38.81	.29	78.1	3.1	4.71	.01	53.9	0.7	27.52	.01	81.4	2.0	54.60	.03	48.1	2.3	0.03	.01	83.0	0.3
Feb. 10.0	38.65	.16	74.9	3.2	4.75	.04	54.5	0.6	27.57	.05	79.3	2.1	54.61	.01	45.8	2.3	0.06	.03	83.1	0.1
20.0	38.63	.02	71.6	3.3	4.82	.07	54.9	0.4	27.67	.10	76.9	2.4	54.65	.04	43.5	2.3	0.12	.06	83.1	0.0
Mar. 2.0	38.75	.12	68.4	3.2	4.92	.10	55.2	0.3	27.81	.14	74.5	2.4	54.73	.08	41.4	2.1	0.22	.10	82.8	0.3
12.0	39.00	.25	65.3	3.1	5.05	.13	55.2	0.0	28.00	.19	71.9	2.6	54.85	.12	39.6	1.8	0.34	.12	82.4	0.4
21.9	39.39	.39	62.6	2.7	5.21	.16	55.0	0.2	28.23	.23	69.4	2.5	55.02	.17	38.1	1.5	0.50	.16	81.7	0.7
31.9	39.90	.51	60.3	2.3	5.41	.20	54.5	0.5	28.51	.28	66.9	2.5	55.23	.21	37.0	1.1	0.69	.19	80.8	0.9
Apr. 10.9	40.50	.60	58.5	1.8	5.64	.23	53.7	0.8	28.83	.32	64.4	2.5	55.47	.24	36.3	0.7	0.91	.22	79.7	1.1
20.8	41.19	.69	57.3	1.2	5.89	.25	52.6	1.1	29.18	.35	62.1	2.3	55.75	.28	36.1	0.2	1.16	.25	78.4	1.3
30.8	41.93	.74	56.6	0.7	6.16	.27	51.3	1.3	29.56	.38	59.9	2.2	56.06	.31	36.4	0.3	1.44	.28	76.8	1.6
May 10.8	42.71	.78	56.6	0.0	6.46	.30	49.8	1.5	29.97	.41	58.0	1.9	56.38	.32	37.2	0.8	1.73	.29	75.2	1.6
20.7	43.49	.78	57.2	0.6	6.77	.31	48.1	1.7	30.40	.43	56.3	1.7	56.72	.34	38.4	1.2	2.04	.31	73.4	1.8
30.7	44.26	.77	58.4	1.2	7.08	.31	46.3	1.8	30.83	.43	55.0	1.3	57.06	.34	40.1	1.7	2.36	.32	71.6	1.8
June 9.7	45.00	.74	60.1	1.7	7.39	.31	44.4	1.9	31.26	.43	54.0	1.0	57.40	.34	42.1	2.0	2.68	.32	69.7	1.9
19.7	45.67	.67	62.4	2.3	7.70	.31	42.4	2.0	31.68	.42	53.3	0.7	57.72	.32	44.5	2.4	2.99	.31	67.9	1.8
29.6	46.26	.59	65.1	2.7	7.98	.28	40.5	1.9	32.08	.40	53.1	0.2	58.02	.30	47.1	2.6	3.29	.30	66.2	1.7
July 9.6	46.76	.50	68.1	3.0	8.24	.26	38.7	1.8	32.45	.37	53.2	0.1	58.29	.27	49.9	2.8	3.56	.27	64.7	1.5
19.6	47.15	.39	71.4	3.3	8.47	.23	37.0	1.7	32.78	.33	53.7	0.5	58.53	.24	52.8	2.9	3.80	.24	63.3	1.4
29.6	47.43	.28	74.9	3.5	8.66	.19	35.5	1.5	33.06	.28	54.6	0.9	58.72	.19	55.8	3.0	4.01	.21	62.1	1.2
Aug. 8.5	47.59	.16	78.6	3.7	8.81	.15	34.1	1.4	33.28	.22	55.9	1.3	58.87	.15	58.7	2.9	4.17	.16	61.1	1.0
18.5	47.62	.03	82.3	3.7	8.92	.11	33.0	1.1	33.44	.16	57.4	1.5	58.96	.09	61.5	2.8	4.30	.13	60.4	0.7
28.5	47.53	.09	86.0	3.7	8.99	.07	32.1	0.9	33.53	.09	59.1	1.7	59.01	.05	64.2	2.7	4.38	.08	59.9	0.5
Sept. 7.5	47.33	.20	89.6	3.6	9.01	.02	31.4	0.7	33.56	.03	61.0	1.9	59.02	.01	66.7	2.5	4.41	.03	59.6	0.3
17.4	47.01	.32	93.0	3.4	8.99	.02	30.9	0.5	33.53	.03	62.9	1.9	58.98	.04	69.0	2.3	4.41	.00	59.5	0.1
27.4	46.59	.42	96.1	3.1	8.94	.05	30.6	0.3	33.44	.09	64.9	2.0	58.90	.08	70.9	1.9	4.37	.04	59.6	0.1
Oct. 7.4	46.07	.52	98.9	2.8	8.86	.08	30.5	0.1	33.31	.13	66.7	1.8	58.78	.12	72.6	1.7	4.30	.07	59.9	0.3
17.4	45.48	.59	101.3	2.4	8.75	.11	30.6	0.1	33.14	.17	68.4	1.7	58.64	.14	73.9	1.3	4.20	.10	60.3	0.4
27.3	44.82	.66	103.3	2.0	8.63	.12	30.9	0.3	32.94	.20	69.8	1.4	58.48	.16	74.9	1.0	4.08	.12	60.8	0.5
Nov. 6.3	44.12	.70	104.8	1.5	8.51	.12	31.3	0.4	32.73	.21	70.9	1.1	58.31	.17	75.4	0.5	3.96	.12	61.4	0.6
16.3	43.38	.74	105.7	0.9	8.38	.13	31.8	0.5	32.51	.22	71.7	0.8	58.13	.18	75.6	0.2	3.83	.13	62.0	0.6
26.2	42.64	.74	106.0	0.3	8.26	.12	32.4	0.6	32.30	.21	72.0	0.3	57.96	.17	75.3	0.3	3.71	.12	62.6	0.6
Dec. 6.2	41.91	.73	105.7	0.3	8.14	.12	33.1	0.7	32.10	.20	72.0	0.0	57.79	.17	74.6	0.7	3.60	.11	63.3	0.7
16.2	41.21	.70	104.8	0.9	8.05	.09	33.8	0.7	31.93	.17	71.6	0.4	57.64	.15	73.6	1.0	3.50	.10	63.9	0.6
26.2	40.57	.64	103.4	1.4	7.97	.08	34.6	0.8	31.79	.14	70.8	0.8	57.51	.13	72.2	1.4	3.42	.08	64.5	0.6
36.1	40.00	.57	101.4	2.0	7.92	.05	35.4	0.8	31.69	.10	69.6	1.2	57.40	.11	70.5	1.7	3.36	.06	65.0	0.5

(CONSTANTS OF STRUVE AND PETERS.)

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	ν Octantis.				γ Aquarii.				π Aquarii.				σ Aquarii.				α Lacertæ.			
	Right Ascension.		Declination *South.*		Right Ascension.		Declination *South.*		Right Ascension.		Declination *North.*		Right Ascension.		Declination *South.*		Right Ascension.		Declination *North.*	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	22 14		−86 25		22 16		− 1 50		22 20		+ 0 54		22 25		−11 8		22 27		+49 48	
	s		″		s		″		s		″		s		″		s		″	
Jan. 1.2	12.46	1.96	74.2	2.8	55.58	.05	54.0	0.7	35.99	.05	47.7	0.8	48.16	.05	48.7	0.4	30.47	.19	57.6	1.9
11.1	10.50	1.45	71.4	3.1	55.53	.03	54.7	0.7	35.94	.04	46.9	0.8	48.11	.03	49.1	0.2	30.28	.15	55.7	2.3
21.1	9.05	0.90	68.3	3.5	55.50	.00	55.4	0.6	35.90	.01	46.1	0.8	48.08	.01	49.3	0.1	30.13	.11	53.4	2.6
31.1	8.15	0.33	64.8	3.6	55.50	.02	56.0	0.5	35.89	.02	45.3	0.7	48.07	.02	49.4	0.1	30.02	.06	50.8	2.8
Feb. 10.0	7.82	0.25	61.2	3.8	55.52	.05	56.5	0.4	35.91	.05	44.6	0.5	48.09	.05	49.3	0.2	29.96	.01	48.0	2.8
20.0	8.07	0.80	57.4	3.8	55.57	.09	56.9	0.2	35.96	.08	44.1	0.3	48.14	.08	49.1	0.4	29.95	.04	45.2	2.7
Mar. 2.0	8.87	1.34	53.6	3.7	55.66	.12	57.1	0.1	36.04	.12	43.8	0.1	48.22	.11	48.7	0.7	29.99	.11	42.5	2.6
12.0	10.21	1.83	49.9	3.5	55.78	.15	57.0	0.3	36.16	.14	43.7	0.2	48.33	.15	48.0	0.9	30.10	.16	39.9	2.3
21.9	12.04	2.29	46.4	3.3	55.93	.18	56.7	0.6	36.30	.18	43.9	0.4	48.48	.18	47.1	1.0	30.26	.22	37.6	1.9
31.9	14.33	2.70	43.1	3.0	56.11	.22	56.1	0.9	36.48	.21	44.3	0.8	48.66	.21	46.1	1.3	30.48	.28	35.7	1.4
Apr. 10.9	17.03	3.04	40.1	2.7	56.33	.24	55.2	1.1	36.69	.24	45.1	1.0	48.87	.24	44.8	1.5	30.76	.32	34.3	1.0
20.9	20.07	3.33	37.4	2.2	56.57	.27	54.1	1.3	36.93	.27	46.1	1.2	49.11	.27	43.3	1.6	31.08	.35	33.3	0.4
30.8	23.40	3.55	35.2	1.8	56.84	.29	52.8	1.6	37.20	.29	47.3	1.5	49.38	.29	41.7	1.8	31.43	.39	32.9	0.2
May 10.8	26.95	3.70	33.4	1.3	57.13	.31	51.2	1.7	37.49	.30	48.8	1.7	49.67	.31	39.9	1.8	31.82	.41	33.1	0.7
20.8	30.65	3.76	32.1	0.7	57.44	.31	49.5	1.9	37.79	.32	50.5	1.9	49.98	.32	38.1	1.9	32.23	.41	33.8	1.2
30.7	34.41	3.74	31.4	0.2	57.75	.32	47.6	1.9	38.11	.31	52.4	1.9	50.30	.32	36.2	1.9	32.64	.41	35.0	1.8
June 9.7	38.15	3.63	31.2	0.3	58.07	.31	45.7	1.9	38.42	.31	54.3	2.0	50.62	.32	34.3	1.8	33.05	.40	36.8	2.1
19.7	41.78	3.43	31.5	0.8	58.38	.29	43.8	1.9	38.73	.29	56.3	2.0	50.94	.31	32.5	1.6	33.45	.37	38.9	2.6
29.7	45.21	3.15	32.3	1.4	58.67	.27	41.9	1.8	39.02	.27	58.3	1.9	51.25	.28	30.9	1.5	33.82	.33	41.5	2.9
July 9.6	48.36	2.77	33.7	1.8	58.94	.24	40.1	1.7	39.29	.24	60.2	1.8	51.53	.25	29.4	1.3	34.15	.29	44.4	3.1
19.6	51.13	2.33	35.5	2.3	59.18	.20	38.4	1.6	39.53	.21	62.0	1.7	51.78	.22	28.1	1.1	34.44	.24	47.5	3.2
29.6	53.46	1.80	37.8	2.5	59.38	.17	36.8	1.3	39.74	.17	63.7	1.5	52.00	.18	27.0	0.9	34.68	.18	50.7	3.4
Aug. 8.6	55.26	1.22	40.3	2.9	59.55	.12	35.5	1.1	39.91	.12	65.2	1.3	52.18	.14	26.1	0.6	34.86	.13	54.1	3.4
18.5	56.48	0.60	43.2	3.0	59.67	.08	34.4	0.9	40.03	.09	66.5	1.0	52.32	.09	25.5	0.4	34.99	.07	57.5	3.4
28.5	57.08	0.04	46.2	3.0	59.75	.04	33.5	0.7	40.12	.04	67.5	0.8	52.41	.05	25.1	0.1	35.06	.01	60.9	3.2
Sept. 7.5	57.04	0.68	49.2	3.0	59.79	.00	32.8	0.4	40.16	.00	68.3	0.7	52.46	.01	25.0	0.1	35.07	.05	64.1	3.0
17.4	56.36	1.29	52.2	2.8	59.79	.04	32.4	0.2	40.16	.04	69.0	0.3	52.47	.03	25.1	0.3	35.02	.09	67.1	2.8
27.4	55.07	1.86	55.0	2.5	59.75	.07	32.2	0.1	40.12	.06	69.3	0.2	52.44	.06	25.4	0.4	34.93	.14	69.9	2.5
Oct. 7.4	53.21	2.36	57.5	2.1	59.68	.09	32.1	0.1	40.06	.09	69.5	0.0	52.38	.08	25.8	0.6	34.79	.18	72.4	2.1
17.4	50.85	2.76	59.6	1.7	59.59	.11	32.2	0.3	39.97	.11	69.5	0.2	52.30	.11	26.4	0.6	34.61	.21	74.5	1.8
27.3	48.09	3.05	61.3	1.1	59.48	.12	32.5	0.4	39.86	.12	69.3	0.3	52.19	.12	27.0	0.7	34.40	.23	76.3	1.3
Nov. 6.3	45.04	3.23	62.4	0.4	59.36	.12	32.9	0.5	39.74	.12	69.0	0.4	52.07	.12	27.7	0.7	34.17	.25	77.6	0.8
16.3	41.81	3.26	62.8	0.1	59.24	.12	33.4	0.6	39.62	.12	68.6	0.6	51.95	.13	28.4	0.6	33.92	.26	78.4	0.3
26.3	38.55	3.18	62.7	0.8	59.12	.11	34.0	0.7	39.50	.12	68.0	0.7	51.82	.11	29.0	0.6	33.66	.25	78.7	0.2
Dec. 6.2	35.37	2.97	61.9	1.5	59.01	.10	34.7	0.7	39.38	.10	67.3	0.7	51.71	.10	29.6	0.6	33.41	.25	78.5	0.8
16.2	32.40	2.66	60.4	2.0	58.91	.09	35.4	0.8	39.28	.08	66.6	0.8	51.61	.09	30.2	0.5	33.16	.23	77.7	1.2
26.2	29.74	2.25	58.4	2.5	58.82	.06	36.2	0.7	39.20	.07	65.8	0.9	51.52	.06	30.7	0.4	32.93	.20	76.5	1.7
36.1	27.49		55.9		58.76		36.9		39.13		64.9		51.46		31.1		32.73		74.8	

(CONSTANTS OF STRUVE AND PETERS.)

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	226 Cephei (B.).				η Aquarii.				10 Lacertæ.				β Octantis.				ζ Pegasi.			
	Right Ascension.		Declination *North.*		Right Ascension.		Declination *South.*		Right Ascension.		Declination *North.*		Right Ascension.		Declination *South.*		Right Ascension.		Declination *North.*	
	h m 22 30		° ′ +75 45		h m 22 30		° ′ − 0 34		h m 22 35		° ′ +38 34		h m 22 36		° ′ −81 51		h m 22 36		° ′ +10 21	
	s		″		s		″		s		″		s		″		s		″	
Jan. 1.2	37.31	.70	36.7	1.8	39.10	.06	80.2	0.8	8.79	.14	38.4	1.8	41.48	0.93	56.2	2.4	53.70	.07	17.1	1.1
11.1	36.61	.61	34.9	2.3	39.04	.04	81.0	0.7	8.65	.11	36.6	2.1	40.55	0.73	53.8	2.9	53.63	.06	16.0	1.2
21.1	36.00	.48	32.6	2.7	39.00	.02	81.7	0.7	8.54	.07	34.5	2.3	39.82	0.51	50.9	3.2	53.57	.03	14.8	1.2
31.1	35.52	.34	29.9	3.0	38.98	.01	82.4	0.5	8.47	.04	32.2	2.3	39.31	0.27	47.7	3.5	53.54	.00	13.6	1.1
Feb. 10.1	35.18	.19	26.9	3.2	38.99	.04	82.9	0.4	8.43	.00	29.9	2.4	39.04	0.02	44.2	3.7	53.54	.03	12.5	1.0
20.0	34.99	.02	23.7	3.2	39.03	.07	83.3	0.2	8.43	.04	27.5	2.3	39.02	0.21	40.5	3.7	53.57	.06	11.5	0.9
Mar. 2.0	34.97	.14	20.5	3.2	39.10	.10	83.5	0.0	8.47	.09	25.2	2.2	39.23	0.45	36.8	3.8	53.63	.09	10.6	0.6
12.0	35.11	.31	17.3	2.9	39.20	.14	83.5	0.2	8.56	.14	23.0	1.8	39.68	0.67	33.0	3.6	53.72	.13	10.0	0 4
21.9	35.42	.46	14.4	2.6	39.34	.17	83.3	0.6	8.70	.19	21.2	1.5	40.35	0.88	29.4	3.5	53.85	.17	9.6	0.0
31.9	35.88	.59	11.8	2.2	39.51	.20	82.7	0.8	8.89	.23	19.7	1.0	41.23	1.08	25.9	3.2	54.02	.20	9.6	0.2
Apr. 10.9	36.47	.71	9.6	1.7	39.71	.24	81.9	1.0	9.12	.27	18.7	0.6	42.31	1.25	22.7	2.9	54.22	.23	9.8	0.6
20.9	37.18	.80	7.9	1.2	39.95	.26	80.9	1.3	9.39	.31	18.1	0.1	43.56	1.40	19.8	2.6	54.45	.26	10.4	0.9
30.8	37.98	.87	6.7	0.5	40.21	.29	79.6	1.6	9.70	.33	18.0	0.4	44.96	1.53	17.2	2.2	54.71	.28	11.3	1.3
May 10.8	38.85	.90	6.2	0.0	40.50	.30	78.0	1.7	10.03	.35	18.4	0.9	46.49	1.61	15.0	1.6	54.99	.30	12.6	1.5
20.8	39.75	.91	6.2	0.7	40.80	.31	76.3	1.9	10.38	.36	19.3	1.4	48.10	1.67	13.4	1.2	55.29	.32	14.1	1.8
30.8	40.66	.89	6.9	1.2	41.11	.32	74.4	1.9	10.74	.37	20.7	1.8	49.77	1.69	12.2	0.7	55.61	.31	15.9	2.0
June 9.7	41.55	.84	8.1	1.8	41.43	.31	72.5	2.0	11.11	.35	22.5	2.2	51.46	1.67	11.5	0.1	55.92	.31	17.9	2.1
19.7	42.39	.78	9.9	2.3	41.74	.30	70.5	2.0	11.46	.33	24.7	2.5	53.13	1.61	11.4	0.4	56.23	.30	20.0	2.2
29.7	43.17	.68	12.2	2.7	42.04	.27	68.5	1.8	11.79	.30	27.2	2.7	54.74	1.50	11.8	1.0	56.53	.28	22.2	2.2
July 9.6	43.85	.58	14.9	3.1	42.31	.25	66.7	1.8	12.09	.27	29.9	3.0	56.24	1.36	12.8	1.5	56.81	.25	24.4	2.2
19.6	44.43	.45	18.0	3.3	42.56	.22	64.9	1.6	12.36	.23	32.9	3.0	57.60	1.17	14.3	1.9	57.06	.22	26.6	2.1
29.6	44.88	.32	21.3	3.6	42.78	.18	63.3	1.5	12.59	.19	35.9	3.1	58.77	0.96	16.2	2.3	57.28	.18	28.7	2.0
Aug. 8.6	45.20	.19	24.9	3.7	42.96	.13	61.8	1.2	12.78	.13	39.0	3.0	59.73	0.71	18.5	2.6	57.46	.14	30.7	1.8
18.5	45.39	.05	28.6	3.7	43.09	.10	60.6	1.0	12.91	.08	42.0	3.0	60.44	0.44	21.1	2.9	57.60	.09	32.5	1.6
28.5	45.44	.08	32.3	3.8	43.19	.05	59.6	0.7	12.99	.03	45.0	2.8	60.88	0.16	24.0	2.9	57.69	.05	34.1	1.4
Sept. 7.5	45.36	.22	36.1	3.6	43.24	.01	58.9	0.6	13.02	.01	47.8	2.6	61.04	0.13	26.9	3.0	57.74	.01	35.5	1.2
17.5	45.14	.35	39.7	3.5	43.25	.03	58.3	0.3	13.01	.05	50.4	2.4	60.91	0.41	29.9	2.9	57.75	.02	36.7	0.9
27.4	44.79	.47	43.2	3.2	43.22	.05	58.0	0.1	12.96	.10	52.8	2.1	60.50	0.67	32.8	2.7	57.73	.05	37.6	0.7
Oct. 7.4	44.32	.58	46.4	2.9	43.17	.09	57.9	0.1	12.86	.12	54.9	1.8	59.83	0.90	35.5	2.4	57.68	.09	38.3	0.5
17.4	43.74	.67	49.3	2.5	43.08	.10	58.0	0.2	12.74	.16	56.7	1.4	58.93	1.09	37.9	1.9	57.59	.10	38.8	0.2
27.3	43.07	.74	51.8	2.1	42.98	.11	58.2	0.4	12.58	.17	58.1	1.0	57.84	1.24	39.8	1.4	57.49	.11	39.0	0.0
Nov. 6.3	42.33	.80	53.9	1.5	42.87	.12	58.6	0.5	12.41	.18	59.1	0.5	56.60	1.34	41.2	0.8	57.38	.12	39.0	0.2
16.3	41.53	.84	55.4	0.9	42.75	.12	59.1	0.6	12.23	.19	59.6	0.1	55.26	1.39	42.0	0.3	57.26	.13	38.8	0.4
26.3	40.69	.86	56.3	0.4	42.63	.11	59.7	0.6	12.04	.18	59.7	0.3	53.87	1.37	42.3	0.4	57.13	.12	38.4	0.6
Dec 6.2	39.83	.85	56.7	0.2	42.52	.11	60.3	0.7	11.86	.18	59.4	0.7	52.50	1.30	41.9	1.0	57.01	.11	37.8	0.8
16.2	38.98	.81	56.5	0.9	42.41	.09	61.0	0.8	11.68	.17	58.7	1.2	51.20	1.20	40.9	1.6	56.90	.10	37.0	0.9
26.2	38.17	.75	55.6	1.5	42.32	.07	61.8	0.8	11.51	.15	57.5	1.5	50.00	1.04	39.3	2.2	56.80	.08	36.1	1.1
36.2	37.42		54.1		42.25		62.6		11.36		56.0		48.96		37.1		56.72		35.0	

(CONSTANTS OF STRUVE AND PETERS.)

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	λ Pegasi.				ι Cephei.				λ Aquarii.				α Piscis Australis. (*Fomalhaut.*)				ο Andromedæ.			
	Right Ascension.		Declination *North.*		Right Ascension.		Declination *North.*		Right Ascension.		Declination *South.*		Right Ascension.		Declination *South.*		Right Ascension.		Declination *North.*	
	h m 22 42		° ′ +23 4		h m 22 46		° ′ +65 42		h m 22 47		° ′ − 8 3		h m 22 52		° ′ −30 6		h m 22 57		° ′ +41 49	
	s		″		s		″		s		″		s		″		s		″	
Jan. 1.2	7.10	.09	70.8	1.4	23.96	.39	87.1	1.7	50.39	.07	60.9	0.5	35.70	.09	34.0	0.4	42.17	.17	76.9	1.6
11.1	7.01	.08	69.4	1.6	23.57	.34	85.4	2.2	50.32	.05	61.4	0.4	35.61	.07	33.6	0.6	42.00	.14	75.3	1.9
21.1	6.93	.05	67.8	1.7	23.23	.27	83.2	2.6	50.27	.03	61.8	0.2	35.54	.03	33.0	0.9	41.86	.11	73.4	2.2
31.1	6.88	.02	66.1	1.8	22.96	.20	80.6	2.9	50.24	.00	62.0	0.1	35.51	.01	32.1	1.2	41.75	.07	71.2	2.4
Feb. 10.1	6.86	.01	64.3	1.7	22.76	.11	77.7	3.0	50.24	.02	62.1	0.1	35.50	.02	30.9	1.4	41.68	.03	68.8	2.4
20.0	6.87	.05	62.6	1.5	22.65	.02	74.7	3.1	50.26	.06	62.0	0.3	35.52	.06	29.5	1.6	41.65	.01	66.4	2.4
Mar. 2.0	6.92	.08	61.1	1.4	22.63	.08	71.6	3.1	50.32	.09	61.7	0.5	35.58	.10	27.9	1.8	41.66	.07	64.0	2.3
12.0	7.00	.13	59.7	1.1	22.71	.17	68.5	2.8	50.41	.12	61.2	0.7	35.68	.13	26.1	2.0	41.73	.11	61.7	2.0
22.0	7.13	.16	58.6	0.7	22 88	.27	65.7	2.5	50.53	.16	60.5	0.9	35.81	.17	24.1	2.1	41.84	.17	59.7	1.7
31.9	7.29	.20	57.9	0.4	23.15	.36	63.2	2.1	50.69	.19	59.6	1.2	35.98	.21	22.0	2.2	42.01	.21	58.0	1.3
Apr. 10.9	7.49	.24	57.5	0.0	23.51	.43	61.1	1.6	50.88	.23	58.4	1.4	36.19	.24	19.8	2.3	42.22	.26	56.7	0.8
20.9	7.73	.27	57.5	0.5	23.94	.49	59.5	1.0	51.11	.25	57.0	1.6	36.43	.28	17.5	2.3	42.48	.30	55.9	0.4
30.8	8.00	.30	58.0	0.8	24.43	.55	58.5	0.5	51.36	.28	55.4	1.8	36.71	.31	15.2	2.2	42.78	.34	55.5	0.1
May 10.8	8.30	.31	58.8	1.3	24.98	.57	58.0	0.1	51.64	.30	53.6	1.9	37.02	.33	13.0	2.2	43.12	.36	55.6	0.7
20.8	8.61	.32	60.1	1.6	25.55	.59	58.1	0.7	51.94	.31	51.7	1.9	37.35	.35	10.8	2.0	43.48	.37	56.3	1.1
30.8	8.93	.33	61.7	1.9	26.14	.58	58.8	1.2	52.25	.32	49.8	1.9	37.70	.36	8.8	1.8	43.85	.38	57.4	1.6
June 9.7	9 26	.33	63.6	2.1	26.72	.57	60 0	1.8	52.57	.32	47.9	2.0	38.06	.36	7.0	1.5	44.23	.37	59.0	2.0
19.7	9.59	.31	65.7	2.4	27.29	.53	61.8	2.3	52.89	.31	45.9	1.8	38.42	.34	5.5	1.3	44.60	.35	61.0	2.3
29.7	9.90	.28	68.1	2.5	27.82	.48	64.1	2.7	53.20	.29	44.1	1.7	38.76	.33	4.2	1.0	44.95	.33	63.3	2.7
July 9.7	10.18	.26	70.6	2.6	28.30	.42	66.8	3.0	53.49	.27	42.4	1.5	39.09	.31	3.2	0.6	45.28	.30	66.0	2.9
19.6	10.44	.22	73.2	2.5	28.72	.35	69.8	3.3	53.76	.23	40.9	1.3	39.40	.27	2.6	0.3	45.58	.26	68.9	3.0
29.6	10.66	.19	75.7	2.6	29.07	.27	73.1	3.5	53.99	.20	39.6	1.1	39.67	.23	2.3	0.1	45.84	.21	71.9	3.1
Aug. 8.6	10.85	.14	78.3	2.4	29.34	.19	76.6	3.6	54.19	.15	38.5	0.8	39.90	.18	2.4	0.4	46.05	.17	75.0	3.1
18.5	10.99	.09	80.7	2.3	29.53	.10	80.2	3.7	54.34	.12	37.7	0.6	40.08	.13	2.8	0.6	46.22	.12	78.1	3.1
28.5	11.08	.05	83.0	2.1	29.63	.02	83.9	3.6	54.46	.07	37.1	0.4	40.21	.09	3.4	1.0	46.34	.06	81.2	3.0
Sept. 7.5	11.13	.01	85.1	1.9	29.65	.06	87.5	3.6	54.53	.03	36.7	0.1	40.30	.04	4.4	1.2	46.40	.01	84.2	2.8
17.5	11.14	.02	87.0	1.6	29.59	.14	91.1	3.4	54.56	.01	36.6	0.1	40.34	.01	5.6	1.3	46.41	.03	87.0	2.6
27.4	11.12	.06	88.6	1.4	29.45	.22	94.5	3.1	54.55	.04	36.7	0.3	40.33	.05	6.9	1.4	46.38	.07	89.6	2.4
Oct. 7.4	11.06	.09	90.0	1.1	29.23	.28	97.6	2.8	54.51	.07	37.0	0.4	40.28	.08	8.3	1.4	46.31	.11	92.0	2.0
17.4	10.97	.11	91.1	0.8	28.95	.34	100.4	2.4	54.44	.09	37.4	0.6	40.20	.10	9.7	1.3	46.20	.14	94.0	1.7
27.4	10.86	.13	91.9	0.5	28.61	.39	102.8	2.0	54.35	.11	38.0	0.6	40.10	.13	11.0	1.3	46.06	.17	95.7	1.3
Nov. 6.3	10.73	.13	92.4	0.1	28.22	.42	104.8	1.5	54.24	.11	38.6	0.7	39.97	.14	12.3	1.1	45.89	.18	97.0	0.9
16.3	10.60	.14	92.5	0.1	27.80	.44	106.3	0.9	54.13	.12	39.3	0.7	39.83	.15	13.4	0.9	45.71	.19	97.9	0.4
26.3	10.46	.14	92.4	0.5	27.36	.46	107.2	0.3	54.01	.11	40.0	0.6	39.68	.14	14.3	0.6	45.52	.19	98.3	0.0
Dec. 6.2	10.32	.13	91.9	0.8	26.90	.46	107.5	0.2	53.90	.11	40.6	0.6	39.54	.13	14.9	0.4	45.33	.20	98.3	0.5
16.2	10.19	.12	91.1	1.0	26.44	.44	107.3	0.8	53.79	.09	41.2	0.6	39.41	.11	15.3	0.0	45.13	.18	97.8	0.9
26.2	10.07	.11	90.1	1.3	26.00	.41	106.5	1.4	53.70	.08	41.8	0.5	39.30	.10	15.3	0.2	44.95	.18	96.9	1.4
36.2	9.96		88.8		25.59		105.1		53.62		42.3		39.20		15.1		44.77		95.5	

(CONSTANTS OF STRUVE AND PETERS.)

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Pegasi. (*Markab.*)				φ Aquarii.				ο Cephei.				τ Pegasi.				θ Piscium.			
	Right Ascension.		Declination *North.*		Right Ascension.		Declination *South.*		Right Ascension.		Declination *North.*		Right Ascension.		Declination *North.*		Right Ascension.		Declination *North.*	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	23 0		+14 42		23 9		− 6 32		23 14		+67 36		23 16		+23 14		23 23		+ 5 52	
	s		″		s		″		s		″		s		″		s		″	
Jan. 1.2	12.03	.09	52.5	1.2	35.05	.08	33.2	0.5	50.91	.46	59.1	1.4	6.34	.11	31.0	1.2	19.63	.10	38.6	0.8
11.2	11.94	.08	51.3	1.2	34.97	.07	33.7	0.5	50.45	.42	57.7	1.8	6.23	.10	29.8	1.4	19.53	.08	37.8	0.9
21.1	11.86	.05	50.1	1.3	34.90	.05	34.2	0.3	50.03	.35	55.9	2.3	6.13	.07	28.4	1.5	19.45	.06	36.9	0.8
31.1	11.81	.03	48.8	1.3	34.85	.02	34.5	0.2	49.68	.28	53.6	2.7	6.06	.06	26.9	1.6	19.39	.04	36.1	0.8
Feb. 10.1	11.78	.01	47.5	1.2	34.83	.00	34.7	0.1	49.40	.19	50.9	2.9	6.00	.02	25.3	1.6	19.35	.01	35.3	0.7
20.1	11.79	.03	46.3	1.0	34.83	.03	34.6	0.2	49.21	.09	48.0	3.0	5.98	.01	23.7	1.5	19.34	.01	34.6	0.5
Mar. 2.0	11.82	.07	45.3	0.9	34.86	.07	34.4	0.4	49.12	.01	45.0	3.0	5.99	.05	22.2	1.3	19.35	.05	34.1	0.3
12.0	11.89	.11	44.4	0.6	34.93	.10	34.0	0.7	49.13	.12	42.0	2.9	6.04	.09	20.9	1.1	19.40	.08	33.8	0.1
22.0	12.00	.14	43.8	0.3	35.03	.13	33.3	0.9	49.25	.22	39.1	2.7	6.13	.13	19.8	0.8	19.48	.12	33.7	0.2
31.9	12.14	.18	43.5	0.0	35.16	.17	32.4	1.1	49.47	.32	36.4	2.4	6.26	.17	19.0	0.5	19.60	.16	33.9	0.4
Apr. 10.9	12.32	.21	43.5	0.3	35.33	.21	31.3	1.4	49.79	.41	34.0	1.9	6.43	.21	18.5	0.1	19.76	.19	34.3	0.8
20.9	12.53	.25	43.8	0.7	35.54	.24	29.9	1.5	50.20	.49	32.1	1.3	6.64	.25	18.4	0.3	19.95	.23	35.1	1.1
30.9	12.78	.28	44.5	1.1	35.78	.27	28.4	1.8	50.69	.55	30.8	0.9	6.89	.28	18.7	0.7	20.18	.26	36.2	1.3
May 10.8	13.06	.30	45.6	1.4	36.05	.29	26.6	1.8	51.24	.60	29.9	0.3	7.17	.30	19.4	1.1	20.44	.28	37.5	1.5
20.8	13.36	.31	47.0	1.6	36.34	.31	24.8	2.0	51.84	.63	29.6	0.3	7.47	.32	20.5	1.4	20.72	.31	39.0	1.8
30.8	13.67	.32	48.6	1.9	36.65	.32	22.8	2.0	52.47	.63	29.9	0.9	7.79	.33	21.9	1.7	21.03	.31	40.8	1.9
June 9.7	13.99	.32	50.5	2.1	36.97	.32	20.8	2.0	53.10	.63	30.8	1.4	8.12	.33	23.6	2.0	21.34	.32	42.7	2.1
19.7	14.31	.31	52.6	2.3	37.29	.31	18.8	1.9	53.73	.60	32.2	2.0	8.45	.32	25.6	2.3	21.66	.31	44.8	2.1
29.7	14.62	.29	54.9	2.3	37.60	.30	16.9	1.8	54.33	.55	34.2	2.4	8.77	.31	27.9	2.4	21.97	.30	46.9	2.1
July 9.7	14.91	.27	57.2	2.3	37.90	.27	15.1	1.6	54.88	.50	36.6	2.7	9.08	.28	30.3	2.5	22.27	.28	49.0	2.1
19.6	15.18	.23	59.5	2.2	38.17	.25	13.5	1.5	55.38	.43	39.3	3.1	9.36	.25	32.8	2.5	22.55	.25	51.1	1.9
29.6	15.41	.20	61.7	2.2	38.42	.21	12.0	1.2	55.81	.36	42.4	3.4	9.61	.22	35.3	2.5	22.80	.22	53.0	1.8
Aug. 8.6	15.61	.16	63.9	2.1	38.63	.18	10.8	0.9	56.17	.27	45.8	3.6	9.83	.17	37.8	2.4	23.02	.18	54.8	1.6
18.6	15.77	.12	66.0	1.8	38.81	.13	9.9	0.7	56.44	.19	49.4	3.6	10.00	.14	40.2	2.3	23.20	.14	56.4	1.5
28.5	15.89	.07	67.8	1.7	38.94	.09	9.2	0.5	56.63	.10	53.0	3.7	10.14	.09	42.5	2.2	23.34	.10	57.9	1.2
Sept. 7.5	15.96	.04	69.5	1.5	39.03	.06	8.7	0.2	56.73	.00	56.7	3.7	10.23	.05	44.7	1.9	23.44	.06	59.1	1.0
17.5	16.00	.00	71.0	1.2	39.09	.01	8.5	0.0	56.73	.08	60.4	3.5	10.28	.01	46.6	1.8	23.50	.03	60.1	0.7
27.5	16.00	.04	72.2	1.0	39.10	.02	8.5	0.2	56.65	.16	63.9	3.4	10.29	.03	48.4	1.5	23.53	.01	60.8	0.5
Oct. 7.4	15.96	.06	73.2	0.7	39.08	.05	8.7	0.4	56.49	.23	67.3	3.1	10.26	.06	49.9	1.2	23.52	.04	61.3	0.3
17.4	15.90	.09	73.9	0.5	39.03	.08	9.1	0.5	56.26	.31	70.4	2.7	10.20	.08	51.1	0.9	23.48	.07	61.6	0.1
27.4	15.81	.10	74.4	0.3	38.95	.09	9.6	0.6	55.95	.36	73.1	2.3	10.12	.10	52.0	0.7	23.41	.08	61.7	0.1
Nov. 6.3	15.71	.12	74.7	0.0	38.86	.10	10.2	0.6	55.59	.42	75.4	1.9	10.02	.12	52.7	0.3	23.33	.10	61.6	0.2
16.3	15.59	.12	74.7	0.3	38.76	.11	10.8	0.7	55.17	.45	77.3	1.4	9.90	.12	53.0	0.1	23.23	.10	61.4	0.4
26.3	15.47	.12	74.4	0.5	38.65	.11	11.5	0.7	54.72	.48	78.7	0.8	9.78	.13	53.1	0.3	23.13	.11	61.0	0.6
Dec. 6.3	15.35	.12	73.9	0.7	38.54	.11	12.2	0.7	54.24	.49	79.5	0.2	9.65	.13	52.8	0.6	23.02	.11	60.4	0.7
16.2	15.23	.11	73.2	0.9	38.43	.10	12.9	0.6	53.75	.49	79.7	0.4	9.52	.13	52.2	0.8	22.91	.11	59.7	0.7
26.2	15.12	.09	72.3	1.0	38.33	.09	13.5	0.6	53.26	.47	79.3	0.9	9.39	.12	51.4	1.1	22.80	.09	59.0	0.8
36.2	15.03		71.3		38.24		14.1		52.79		78.4		9.27		50.3		22.71		58.2	

FIXED STARS, 1909.

(CONSTANTS OF STRUVE AND PETERS.)

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	λ Andromedæ.				ι Piscium.				γ Cephei.				i^1 Aquarii.			
	Right Ascension.		Declination *North*.		Right Ascension.		Declination *North*.		Right Ascension.		Declination *North*.		Right Ascension.		Declination *South*.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	23 33		+45 57		23 35		+ 5 7		23 35		+77 7		23 39		−18 46	
	s		″		s		″		s		″		s		″	
Jan. 1.2	4.86	.20	60.7	1.3	14.76	.10	52.4	0.8	33.76	0.89	40.3	0.9	27.59	.10	70.0	0.2
11.2	4.66	.19	59.4	1.6	14.66	.08	51.6	0.8	32.87	0.83	39.4	1.5	27.49	.09	70.2	0.0
21.2	4.47	.16	57.8	2.0	14.58	.07	50.8	0.8	32.04	0.73	37.9	2.0	27.40	.08	70.2	0.3
31.1	4.31	.12	55.8	2.2	14.51	.05	50.0	0.7	31.31	0.60	35.9	2.5	27.32	.05	69.9	0.5
Feb. 10.1	4.19	.08	53.6	2.4	14.46	.02	49.3	0.7	30.71	0.46	33.4	2.8	27.27	.02	69.4	0.7
20.1	4.11	.04	51.2	2.5	14.44	.00	48.6	0.4	30.25	0.30	30.6	3.0	27.25	.00	68.7	1.0
Mar. 2.0	4.07	.01	48.7	2.4	14.44	.04	48.2	0.3	29.95	0.12	27.6	3.1	27.25	.04	67.7	1.2
12.0	4.08	.07	46.3	2.2	14.48	.07	47.9	0.0	29.83	0.07	24.5	3.1	27.29	.07	66.5	1.4
22.0	4.15	.13	44.1	2.0	14.55	.11	47.9	0.2	29.90	0.25	21.4	2.9	27.36	.11	65.1	1.7
Apr. 1.0	4.28	.18	42.1	1.6	14.66	.14	48.1	0.5	30.15	0.43	18.5	2.7	27.47	.15	63.4	1.8
10.9	4.46	.24	40.5	1.3	14.80	.19	48.6	0.8	30.58	0.59	15.8	2.3	27.62	.18	61.6	2.0
20.9	4.70	.29	39.2	0.8	14.99	.22	49.4	1.0	31.17	0.73	13.5	1.8	27.80	.22	59.6	2.1
30.9	4.99	.33	38.4	0.3	15.21	.25	50.4	1.4	31.90	0.84	11.7	1.3	28.02	.26	57.5	2.2
May 10.9	5.32	.36	38.1	0.2	15.46	.28	51.8	1.6	32.74	0.93	10.4	0.8	28.28	.29	55.3	2.2
20.8	5.68	.39	38.3	0.7	15.74	.30	53.4	1.7	33.67	0.98	9.6	0.2	28.57	.31	53.1	2.2
30.8	6.07	.40	39.0	1.2	16.04	.32	55.1	1.9	34.65	1.01	9.4	0.4	28.88	.32	50.9	2.2
June 9.8	6.47	.40	40.2	1.6	16.36	.32	57.0	2.1	35.66	1.01	9.8	1.0	29.20	.33	48.7	2.0
19.7	6.87	.39	41.8	2.0	16.68	.31	59.1	2.1	36.67	0.98	10.8	1.5	29.53	.33	46.7	1.8
29.7	7.26	.37	43.8	2.4	16.99	.30	61.2	2.0	37.65	0.91	12.3	2.0	29.86	.32	44.9	1.6
July 9.7	7.63	.34	46.2	2.7	17.29	.29	63.2	2.0	38.56	0.84	14.3	2.5	30.18	.30	43.3	1.4
19.6	7.97	.31	48.9	2.9	17.58	.26	65.2	1.9	39.40	0.74	16.8	2.8	30.48	.28	41.9	1.0
29.6	8.28	.27	51.8	3.0	17.84	.23	67.1	1.8	40.14	0.62	19.6	3.2	30.76	.25	40.9	0.7
Aug. 8.6	8.55	.21	54.8	3.1	18.07	.19	68.9	1.6	40.76	0.50	22.8	3.5	31.01	.21	40.2	0.4
18.6	8.76	.17	57.9	3.2	18.26	.15	70.5	1.4	41.26	0.35	26.3	3.6	31.22	.17	39.8	0.1
28.5	8.93	.12	61.1	3.1	18.41	.12	71.9	1.2	41.61	0.21	29.9	3.8	31.39	.13	39.7	0.2
Sept. 7.5	9.05	.06	64.2	3.0	18.53	.07	73.1	0.9	41.82	0.07	33.7	3.8	31.52	.08	39.9	0.5
17.5	9.11	.02	67.2	2.9	18.60	.04	74.0	0.7	41.89	0.08	37.5	3.8	31.60	.04	40.4	0.7
27.5	9.13	.03	70.1	2.6	18.64	.00	74.7	0.5	41.81	0.22	41.3	3.7	31.64	.01	41.1	0.9
Oct. 7.4	9.10	.07	72.7	2.4	18.64	.03	75.2	0.2	41.59	0.36	45.0	3.4	31.65	.03	42.0	1.0
17.4	9.03	.11	75.1	2.1	18.61	.05	75.4	0.1	41.23	0.48	48.4	3.2	31.62	.06	43.0	1.1
27.4	8.92	.14	77.2	1.7	18.56	.07	75.5	0.2	40.75	0.60	51.6	2.8	31.56	.08	44.1	1.1
Nov. 6.4	8.78	.17	78.9	1.4	18.49	.09	75.3	0.2	40.15	0.71	54.4	2.4	31.48	.09	45.2	1.1
16.3	8.61	.19	80.3	0.9	18.40	.10	75.1	0.5	39.44	0.79	56.8	1.9	31.39	.11	46.3	1.0
26.3	8.42	.20	81.2	0.4	18.30	.10	74.6	0.5	38.65	0.86	58.7	1.4	31.28	.12	47.3	0.9
Dec. 6.3	8.22	.21	81.6	0.1	18.20	.11	74.1	0.7	37.79	0.90	60.1	0.7	31.16	.11	48.2	0.7
16.3	8.01	.21	81.5	0.5	18.09	.11	73.4	0.7	36.89	0.91	60.8	0.1	31.05	.12	48.9	0.5
26.2	7.80	.20	81.0	1.0	17.98	.09	72.7	0.8	35.98	0.91	60.9	0.5	30.93	.10	49.4	0.4
36.2	7.60		80.0		17.89		71.9		35.07		60.4		30.83		49.8	

(CONSTANTS OF STRUVE AND PETERS.)

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	δ Sculptoris..				γ^1 Octantis.				Groombridge 4163.				ω Piscium.			
	Right Ascension.		Declination *South.*		Right Ascension.		Declination *South.*		Right Ascension.		Declination *North.*		Right Ascension.		Declination *North.*	
	h m 23 44		° ′ −28 37		h m 23 46		° ′ −82 31		h m 23 50		° ′ +73 53		h m 23 54		° ′ + 6 21	
	s		″		s		″		s		″		s		″	
Jan. 1.2	9.83	.12	79.2	0.0	44.01	1.38	54.9	1.7	21.35	.69	86.1	0.7	36.98	.10	28.6	0.8
11.2	9.71	.10	79.2	0.4	42.63	1.23	53.2	2.2	20.66	.66	85.4	1.4	36.88	.10	27.8	0.8
21.2	9.61	.09	78.8	0.7	41.40	1.05	51.0	2.7	20.00	.60	84.0	1.9	36.78	.08	27.0	0.8
31.1	9.52	.06	78.1	1.0	40.35	0.85	48.3	3.2	19.40	.50	82.1	2.3	36.70	.07	26.2	0.8
Feb. 10.1	9.46	.04	77.1	1.3	39.50	0.62	45.1	3.4	18.90	.40	79.8	2.7	36.63	.04	25.4	0.6
20.1	9.42	.00	75.8	1.5	38.88	0.37	41.7	3.7	18.50	.27	77.1	2.9	36.59	.02	24.8	0.5
Mar. 2.1	9.42	.03	74.3	1.8	38.51	0.13	38.0	3.8	18.23	.13	74.2	3.0	36.57	.02	24.3	0.3
12.0	9.45	.06	72.5	2.0	38.38	0.13	34.2	3.9	18.10	.02	71.2	3.0	36.59	.05	24.0	0.1
22.0	9.51	.11	70.5	2.1	38.51	0.38	30.3	3.8	18.12	.17	68.2	2.9	36.64	.09	23.9	0.2
Apr. 1.0	9.62	.15	68.4	2.3	38.89	0.63	26.5	3.7	18.29	.31	65.3	2.7	36.73	.13	24.1	0.4
11.0	9.77	.19	66.1	2.5	39.52	0.86	22.8	3.6	18.60	.45	62.6	2.3	36.86	.16	24.5	0.7
20.9	9.96	.23	63.6	2.5	40.38	1.07	19.2	3.3	19.05	.56	60.3	1.9	37.02	.21	25.2	1.0
30.9	10.19	.27	61.1	2.5	41.45	1.27	15.9	2.9	19.61	.67	58.4	1.4	37.23	.24	26.2	1.3
May 10.9	10.46	.30	58.6	2.4	42.72	1.44	13.0	2.6	20.28	.75	57.0	0.9	37.47	.27	27.5	1.5
20.8	10.76	.32	56.2	2.3	44.16	1.58	10.4	2.1	21.03	.80	56.1	0.3	37.74	.30	29.0	1.7
30.8	11.08	.34	53.9	2.2	45.74	1.68	8.3	1.6	21.83	.83	55.8	0.3	38.04	.31	30.7	1.9
June 9.8	11.42	.35	51.7	2.0	47.42	1.74	6.7	1.1	22.66	.84	56.1	0.9	38.35	.31	32.6	2.0
19.8	11.77	.35	49.7	1.7	49.16	1.76	5.6	0.5	23.50	.83	57.0	1.4	38.66	.32	34.6	2.1
29.7	12.12	.34	48.0	1.4	50.92	1.74	5.1	0.0	24.33	.78	58.4	1.9	38.98	.31	36.7	2.1
July 9.7	12.46	.33	46.6	1.0	52.66	1.66	5.1	0.6	25.11	.73	60.3	2.3	39.29	.29	38.8	2.0
19.7	12.79	.30	45.6	0.7	54.32	1.54	5.7	1.2	25.84	.65	62.6	2.8	39.58	.27	40.8	2.0
29.6	13.09	.26	44.9	0.3	55.86	1.37	6.9	1.7	26.49	.57	65.4	3.1	39.85	.24	42.8	1.8
Aug. 8.6	13.35	.23	44.6	0.1	57.23	1.16	8.6	2.1	27.06	.46	68.5	3.3	40.09	.21	44.6	1.7
18.6	13.58	.18	44.7	0.4	58.39	0.92	10.7	2.5	27.52	.36	71.8	3.6	40.30	.17	46.3	1.5
28.6	13.76	.14	45.1	0.8	59.31	0.63	13.2	2.8	27.88	.24	75.4	3.7	40.47	.13	47.8	1.2
Sept. 7.5	13.90	.10	45.9	1.0	59.94	0.33	16.0	2.9	28.12	.13	79.1	3.8	40.60	.10	49.0	1.0
17.5	14.00	.05	46.9	1.3	60.27	0.03	18.9	3.1	28.25	.01	82.9	3.7	40.70	.06	50.0	0.8
27.5	14.05	.00	48.2	1.4	60.30	0.28	22.0	3.0	28.26	.11	86.6	3.7	40.76	.02	50.8	0.6
Oct. 7.5	14.05	.03	49.6	1.5	60.02	0.58	25.0	2.8	28.15	.22	90.3	3.4	40.78	.01	51.4	0.3
17.4	14.02	.06	51.1	1.6	59.44	0.86	27.8	2.6	27.93	.32	93.7	3.2	40.77	.04	51.7	0.2
27.4	13.96	.09	52.7	1.5	58.58	1.09	30.4	2.2	27.61	.42	96.9	2.9	40.73	.06	51.9	0.1
Nov. 6.4	13.87	.11	54.2	1.3	57.49	1.28	32.6	1.7	27.19	.50	99.8	2.5	40.67	.07	51.8	0.2
16.4	13.76	.13	55.5	1.2	56.21	1.43	34.3	1.2	26.69	.58	102.3	1.9	40.60	.09	51.6	0.4
26.3	13.63	.13	56.7	1.0	54.78	1.52	35.5	0.5	26.11	.64	104.2	1.5	40.51	.10	51.2	0.4
Dec. 6.3	13.50	.13	57.7	0.7	53.26	1.55	36.0	0.1	25.47	.69	105.7	0.9	40.41	.11	50.8	0.6
16.3	13.37	.13	58.4	0.4	51.71	1.52	35.9	0.7	24.78	.70	106.6	0.2	40.30	.10	50.2	0.7
26.2	13.24	.12	58.8	0.1	50.19	1.45	35.2	1.3	24.08	.71	106.8	0.4	40.20	.11	49.5	0.7
36.2	13.12		58.9		48.74		33.9		23.37		106.4		40.09		48.8	

FOR WASHINGTON MEAN AND APPARENT NOON.

Date.	Apparent Right Ascension.		Apparent Declination.		Hourly Motion.		Equation of Time for Apparent Noon.	Semi-diameter at Apparent Noon.	Sidereal Time of Semid. Passing Meridian.	Sidereal Time of Mean Noon.
	Mean Noon.	App. Noon.	Mean Noon.	App. Noon.	Right Ascen.	Declination.				
	h m s	s	° ′ ″	″	s	″	m s	′ ″	m s	h m s
Jan. 1	18 46 29.28	29.95	−23 1 16.1	15.5	11.038	+12.26	+ 3 39.90	16 17.89	1 11.05	18 42 49.48
2	18 50 54.04	54.79	22 56 8.1	7.2	11.023	13.41	4 8.07	16 17.90	1 10.99	18 46 46.04
3	18 55 18.40	19.24	22 50 32.7	31.6	11.008	14.55	4 35.88	16 17.90	1 10.95	18 50 42.60
4	18 59 42.38	43.30	22 44 30.1	28.8	10.990	15.68	5 3.32	16 17.89	1 10.90	18 54 39.16
5	19 4 5.96	6.95	22 37 60.5	58.9	10.973	16.80	5 30.33	16 17.88	1 10.85	18 58 35.72
6	19 8 29.09	30.17	−22 31 4.0	2.2	10.955	+17.91	+ 5 56.90	16 17.86	1 10.79	19 2 32.27
7	19 12 51.75	52.90	22 23 40.9	38.9	10.935	19.02	6 23.01	16 17.83	1 10.73	19 6 28.83
8	19 17 13.91	15.14	22 15 51.3	49.1	10.914	20.12	6 48.63	16 17.80	1 10.66	19 10 25.39
9	19 21 35.57	36.88	22 7 35.5	33.0	10.891	21.21	7 13.74	16 17.77	1 10.59	19 14 21.95
10	19 25 56.70	58.08	21 58 53.7	50.9	10.869	22.28	7 38.32	16 17.73	1 10.52	19 18 18.50
11	19 30 17.27	18.72	−21 49 46.2	43.2	10.845	+23.34	+ 8 2.33	16 17.68	1 10.44	19 22 15.06
12	19 34 37.27	38.78	21 40 13.4	10.0	10.821	24.40	8 25.76	16 17.63	1 10.35	19 26 11.62
13	19 38 56.66	58.24	21 30 15.4	11.7	10.795	25.44	8 48.60	16 17.57	1 10.26	19 30 8.18
14	19 43 15.43	17.08	21 19 52.4	48.4	10.768	26.47	9 10.83	16 17.50	1 10.17	19 34 4.74
15	19 47 33.58	35.29	21 9 4.8	0.5	10.741	27.50	9 32.43	16 17.42	1 10.08	19 38 1.29
16	19 51 51.08	52.84	−20 57 52.8	48.2	10.714	+28.50	+ 9 53.37	16 17.34	1 9.99	19 41 57.85
17	19 56 7.91	9.72	20 46 16.7	11.7	10.687	29.50	10 13.63	16 17.26	1 9.89	19 45 54.41
18	20 0 24.04	25.91	20 34 16.9	11.5	10.658	30.48	10 33.21	16 17.18	1 9.79	19 49 50.96
19	20 4 39.47	4.1 39	20 21 53.7	48.0	10.628	31.45	10 52.08	16 17.09	1 9.69	19 53 47.52
20	20 8 54.17	56.14	20 9 7.5	1.5	10.596	32.40	11 10.22	16 17.00	1 9.59	19 57 44.08
21	20 13 8.12	10.14	−19 55 58.6	52.3	10.565	+33.34	+11 27.61	16 16.91	1 9.48	20 1 40.64
22	20 17 21.30	23.37	19 42 27.4	20.8	10.533	34.26	11 44.24	16 16.81	1 9.38	20 5 37.19
23	20 21 33.71	35.81	19 28 34.2	27.3	10.501	35.18	12 0.08	16 16.71	1 9.27	20 9 33.75
24	20 25 45.32	47.46	19 14 19.4	12.1	10.467	36.07	12 15.14	16 16.60	1 9.16	20 13 30.31
25	20 29 56.13	58.31	18 59 43.4	35.8	10.433	36.93	12 29.39	16 16.50	1 9.05	20 17 26.86
26	20 34 6.12	8.33	−18 44 46.6	38.7	10.399	+37.79	+12 42.82	16 16.39	1 8.94	20 21 23.42
27	20 38 15.29	17.52	18 29 29.4	21.2	10.365	38.64	12 55.42	16 16.27	1 8.83	20 25 19.98
28	20 42 23.62	25.88	18 13 52.2	43.6	10.330	39.47	13 7.20	16 16.15	1 8.72	20 29 16.53
29	20 46 31.11	33.40	17 57 55.3	46.4	10.295	40.28	13 18.13	16 16.02	1 8.60	20 33 13.09
30	20 50 37.77	40.07	17 41 39.2	30.1	10.260	41.08	13 28.22	16 15.89	1 8.49	20 37 9.64
31	20 54 43.59	45.91	−17 24 64.4	55.0	10.226	+41.84	+13 37.48	16 15.76	1 8.37	20 41 6.20
Feb. 1	20 58 48.57	50.90	17 8 11.1	1.5	10.191	42.59	13 45.89	16 15.62	1 8.26	20 45 2.76
2	21 2 52.72	55.06	16 50 59.8	49.9	10.156	43.34	13 53.47	16 15.48	1 8.14	20 48 59.31
3	21 6 56.04	58.39	16 33 30.9	20.7	10.121	44.06	14 0.23	16 15.33	1 8.03	20 52 55.87
4	21 10 58.53	60.90	16 15 44.8	34.4	10.087	44.77	14 6.16	16 15.17	1 7.91	20 56 52.42
5	21 15 0.21	2.58	−15 57 41.9	31.2	10.053	+45.47	+14 11.28	16 15.01	1 7.80	21 0 48.98
6	21 19 1.08	3.46	15 39 22.6	11.6	10.019	46.14	14 15.58	16 14.84	1 7.68	21 4 45.53
7	21 23 1.15	3.53	15 20 47.2	36.1	9.986	46.81	14 19.09	16 14.67	1 7.57	21 8 42.09
8	21 27 0.42	2.81	15 1 56.2	44.9	9.953	47.44	14 21.81	16 14.49	1 7.45	21 12 38.64
9	21 30 58.92	61.30	14 42 50.0	38.5	9.921	48.07	14 23.75	16 14.30	1 7.34	21 16 35.20
10	21 34 56.65	59.02	−14 23 29.0	17.4	9.889	+48.68	+14 24.91	16 14.12	1 7.23	21 20 31.75
11	21 38 53.61	55.97	14 3 53.7	42.0	9.857	49.26	14 25.30	16 13.93	1 7.12	21 24 28.31
12	21 42 49.81	52.17	13 43 64.4	52.5	9.826	49.84	14 24.94	16 13.74	1 7.01	21 28 24.86
13	21 46 45.27	47.62	13 23 61.4	49.4	9.796	50.40	14 23.84	16 13.54	1 6.90	21 32 21.42
14	21 50 40.00	42.34	13 3 45.2	33.1	9.766	50.93	14 22.01	16 13.35	1 6.80	21 36 17.97
15	21 54 34.01	36.33	−12 43 16.2	4.0	9.736	+51.46	+14 19.46	16 13.15	1 6.70	21 40 14.53
16	21 58 27.31	29.61	−12 22 34.9	22.6	9.706	+51.97	+14 16.19	16 12.94	1 6.59	21 44 11.08

Note.—For mean time interval of semidiameter passing meridian, subtract $0^s.19$ from the sidereal interval.

FOR WASHINGTON MEAN AND APPARENT NOON.

Date.	Apparent Right Ascension.		Apparent Declination.		Hourly Motion.		Equation of Time for Apparent Noon.	Semi-diameter at Apparent Noon.	Sidereal Time of Semid. Passing Meridian.	Sidereal Time of Mean Noon.
	Mean Noon.	App. Noon.	Mean Noon.	App. Noon.	Right Ascen.	Declination.				
	h m s	s	° ′ ″	″	s	″	m s	′ ″	m s	h m s
Feb. 16	21 58 27.31	29.61	−12 22 34.9	22.6	9.706	+51.97	+14 16.19	16 12.94	1 6.59	21 44 11.08
17	22 2 19.91	22.19	12 1 41.7	29.3	9.677	52.46	14 12.22	16 12.73	1 6.48	21 48 7.64
18	22 6 11.81	14.08	11 40 37.0	24.4	9.648	52.94	14 7.57	16 12.51	1 6.38	21 52 4.19
19	22 10 3.03	5.28	11 19 21.0	8.4	9.620	53.38	14 2.24	16 12.29	1 6.28	21 56 0.75
20	22 13 53.58	55.81	10 57 54.3	41.8	9.592	53.82	13 56.23	16 12.07	1 6.19	21 59 57.30
21	22 17 43.47	45.68	−10 36 17.5	5.0	9.565	+54.24	+13 49.55	16 11.85	1 6.09	22 3 53.86
22	22 21 32.70	34.89	10 14 30.9	18.4	9.538	54.64	13 42.22	16 11.63	1 6.00	22 7 50.41
23	22 25 21.29	23.45	9 52 34.9	22.4	9.511	55.02	13 34.25	16 11.41	1 5.91	22 11 46.96
24	22 29 9.24	11.37	9 30 29.9	17.5	9.485	55.38	13 25.64	16 11.19	1 5.82	22 15 43.52
25	22 32 56.58	58.68	9 8 16.4	4.1	9.460	55.73	13 16.42	16 10.97	1 5.73	22 19 40.07
26	22 36 43.33	45.40	− 8 45 54.8	42.6	9.435	+56.06	+13 6.61	16 10.74	1 5.65	22 23 36.63
27	22 40 29.49	31.53	8 23 25.6	13.5	9.411	56.37	12 56.22	16 10.51	1 5.57	22 27 33.18
28	22 44 15.08	17.09	8 0 49.2	37.1	9.388	56.67	12 45.25	16 10.28	1 5.49	22 31 29.73
Mar. 1	22 48 0.12	2.10	7 37 65.8	53.8	9.366	56.96	12 33.74	16 10.05	1 5.41	22 35 26.29
2	22 51 44.64	46.58	7 15 16.0	4.2	9.345	57.20	12 21.72	16 9.81	1 5.34	22 39 22.84
3	22 55 28.65	30.55	− 6 52 20.2	8.6	9.324	+57.45	+12 9.18	16 9.57	1 5.28	22 43 19.39
4	22 59 12.18	14.04	6 29 18.6	7.2	9.304	57.68	11 56.15	16 9.33	1 5.21	22 47 15.95
5	23 2 55.25	57.06	6 6 11.7	0.4	9.285	57.89	11 42.65	16 9.08	1 5.14	22 51 12.50
6	23 6 37.88	39.64	5 42 59.8	48.6	9.267	58.09	11 28.71	16 8.83	1 5.08	22 55 9.05
7	23 10 20.09	21.81	5 19 43.3	32.2	9.250	58.28	11 14.37	16 8.56	1 5.02	22 59 5.61
8	23 14 1.90	3.59	− 4 56 22.5	11.7	9.234	+58.44	+10 59.62	16 8.30	1 4.96	23 3 2.16
9	23 17 43.33	44.99	4 32 57.9	47.4	9.219	58.60	10 44.52	16 8.04	1 4.90	23 6 58.71
10	23 21 24.42	26.03	4 9 29.8	19.6	9.205	58.74	10 29.06	16 7.78	1 4.85	23 10 55.26
11	23 25 5.19	6.76	3 45 58.6	48.6	9.192	58.85	10 13.27	16 7.51	1 4.80	23 14 51.82
12	23 28 45.65	47.18	3 22 24.7	14.9	9.181	58.96	9 57.17	16 7.25	1 4.75	23 18 48.37
13	23 32 25.82	27.30	− 2 58 48.3	38.8	9.169	+59.06	+ 9 40.79	16 6.98	1 4.71	23 22 44.92
14	23 36 5.73	7.16	2 35 9.8	0.5	9.158	59.13	9 24.15	16 6.71	1 4.67	23 26 41.47
15	23 39 45.40	46.79	2 11 29.6	20.5	9.148	59.20	9 7.27	16 6.44	1 4.63	23 30 38.03
16	23 43 24.85	26.20	1 47 48.1	39.3	9.139	59.25	8 50.17	16 6.17	1 4.59	23 34 34.58
17	23 47 4.10	5.41	1 23 65.6	57.1	9.131	59.28	8 32.87	16 5.89	1 4.56	23 38 31.14
18	23 50 43.17	44.43	− 1 0 22.5	14.3	9.124	+59.30	+ 8 15.39	16 5.61	1 4.54	23 42 27.69
19	23 54 22.07	23.29	0 36 39.2	31.3	9.118	59.30	7 57.74	16 5.33	1 4.52	23 46 24.24
20	23 58 0.83	2.00	− 0 12 56.0	48.4	9.112	59.29	7 39.95	16 5.15	1 4.50	23 50 20.79
21	0 1 39.46	40.58	+ 0 10 46.7	54.0	9.107	59.26	7 22.03	16 4.78	1 4.48	23 54 17.35
22	0 5 17.98	19.04	0 34 28.4	35.4	9.102	59.21	7 4.00	16 4.50	1 4.47	23 58 13.90
23	0 8 56.40	57.41	+ 0 58 8.8	15.5	9.098	+59.14	+ 6 45.87	16 4.23	1 4.45	0 2 10.45
24	0 12 34.73	35.70	1 21 47.4	53.8	9.095	59.06	6 27.65	16 3.95	1 4.44	0 6 7.01
25	0 16 13.00	13.93	1 45 23.9	30.0	9.093	58.97	6 9.37	16 3.68	1 4.44	0 10 3.56
26	0 19 51.22	52.10	2 8 57.9	63.7	9.092	58.85	5 51.04	16 3.41	1 4.43	0 14 0.11
27	0 23 29.41	30.25	2 32 29.1	34.6	9.091	58.73	5 32.68	16 3.14	1 4.43	0 17 56.67
28	0 27 7.58	8.38	+ 2 55 57.1	62.3	9.091	+58.60	+ 5 14.30	16 2.87	1 4.44	0 21 53.22
29	0 30 45.76	46.51	3 19 21.6	26.5	9.092	58.44	4 55.93	16 2.60	1 4.44	0 25 49.77
30	0 34 23.98	24.67	3 42 42.1	46.7	9.094	58.26	4 37.59	16 2.33	1 4.45	0 29 46.32
31	0 38 2.25	2.90	4 5 58.2	62.4	9.096	58.07	4 19.31	16 2.06	1 4.46	0 33 42.88
Apr. 1	0 41 40.59	41.20	4 29 9.7	13.5	9.100	57.88	4 1.11	16 1.78	1 4.48	0 37 39.43
2	0 45 19.02	19.59	+ 4 52 16.3	19.8	9.104	+57.67	+ 3 43.00	16 1.51	1 4.49	0 41 35.98
3	0 48 57.57	58.09	+ 5 15 17.7	21.0	9.109	+57.45	+ 3 24.99	16 1.24	1 4.51	0 45 32.54

NOTE.—For mean time interval of semidiameter passing meridian, subtract $0^{s}.18$ from the sidereal interval.

FOR WASHINGTON MEAN AND APPARENT NOON.

Date.	Apparent Right Ascension.		Apparent Declination.		Hourly Motion.		Equation of Time for Apparent Noon.	Semi-diameter at Apparent Noon.	Sidereal Time of Semid. Passing Meridian.	Sidereal Time of Mean Noon.
	Mean Noon.	App. Noon.	Mean Noon.	App. Noon.	Right Ascen.	Declination.				
	h m s	s	° ′ ″	″	s	″	m s	′ ″	m s	h m s
Apr. 1	0 41 40.59	41.20	+ 4 29 9.7	13.5	9.100	+ 57.88	+ 4 1.11	16 1.78	1 4.48	0 37 39.43
2	0 45 19.02	19.59	4 52 16.3	19.8	9.104	57.67	3 43.00	16 1.51	1 4.49	0 41 35.98
3	0 48 57.57	58.09	5 15 17.7	21.0	9.109	57.45	3 24.99	16 1.24	1 4.51	0 45 32.54
4	0 52 36.26	36.73	5 38 13.4	16.5	9.115	57.20	3 7.13	16 0.97	1 4.53	0 49 29.09
5	0 56 15.10	15.53	6 1 3.1	5.9	9.122	56.94	2 49.42	16 0.69	1 4.57	0 53 25.64
6	0 59 54.12	54.51	+ 6 23 46.5	49.0	9.129	+ 56.67	+ 2 31.89	16 0.41	1 4.60	0 57 22.20
7	1 3 33.35	33.69	6 46 23.5	25.6	9.138	56.40	2 14.57	16 0.13	1 4.63	1 1 18.75
8	1 7 12.80	13.10	7 8 53.6	55.4	9.149	56.11	1 57.47	15 59.85	1 4.66	1 5 15.30
9	1 10 52.49	52.74	7 31 16.4	18.0	9.159	55.80	1 40.61	15 59.58	1 4.70	1 9 11.86
10	1 14 32.44	32.65	7 53 31.6	32.9	9.170	55.48	1 24.02	15 59.30	1 4.73	1 13 8.41
11	1 18 12.68	12.85	+ 8 15 38.9	39.9	9.182	+ 55.14	+ 1 7.71	15 59.02	1 4.77	1 17 4.96
12	1 21 53.22	53.35	8 37 38.1	38.9	9.195	54.79	0 51.70	15 58.75	1 4.81	1 21 1.52
13	1 25 34.08	34.17	8 59 28.8	29.4	9.209	54.43	0 36.00	15 58.47	1 4.86	1 24 58.07
14	1 29 15.28	15.33	9 21 10.7	11.1	9.224	54.05	0 20.65	15 58.19	1 4.90	1 28 54.62
15	1 32 56.83	56.85	9 42 43.4	43.5	9.239	53.67	+ 0 5.66	15 57.91	1 4.95	1 32 51.17
16	1 36 38.75	38.73	+ 10 4 6.6	6.4	9.254	+ 53.26	− 0 8.97	15 57.64	1 5.00	1 36 47.73
17	1 40 21.04	20.99	10 25 19.9	19.6	9.270	52.84	0 23.24	15 57.37	1 5.06	1 40 44.28
18	1 44 3.73	3.64	10 46 23.0	22.6	9.286	52.41	0 37.10	15 57.10	1 5.11	1 44 40.84
19	1 47 46.82	46.69	11 7 15.6	15.0	9.303	51.96	0 50.57	15 56.84	1 5.17	1 48 37.39
20	1 51 30.32	30.15	11 27 57.3	56.4	9.321	51.50	1 3.62	15 56.58	1 5.23	1 52 33.95
21	1 55 14.24	14.04	+ 11 48 27.7	26.6	9.339	+ 51.02	− 1 16.25	15 56.32	1 5.30	1 56 30.50
22	1 58 58.59	58.36	12 8 46.3	45.1	9.357	50.52	1 28.45	15 56.07	1 5.36	2 0 27.06
23	2 2 43.37	43.11	12 28 52.9	51.5	9.375	50.02	1 40.22	15 55.82	1 5.43	2 4 23.61
24	2 6 28.60	28.31	12 48 47.2	45.6	9.393	49.49	1 51.54	15 55.57	1 5.50	2 8 20.17
25	2 10 14.29	13.96	13 8 28.8	27.1	9.412	48.95	2 2.42	15 55.33	1 5.57	2 12 16.72
26	2 14 0.43	0.08	+ 13 27 57.3	55.5	9.432	+ 48.40	− 2 12.82	15 55.08	1 5.64	2 16 13.27
27	2 17 47.05	46.68	13 47 12.5	10.5	9.452	47.85	2 22.77	15 54.84	1 5.71	2 20 9.83
28	2 21 34.17	33.77	14 6 14.0	11.9	9.473	47.26	2 32.21	15 54.60	1 5.78	2 24 6.38
29	2 25 21.78	21.36	14 24 61.4	59.3	9.494	46.67	2 41.14	15 54.36	1 5.86	2 28 2.94
30	2 29 9.89	9.45	14 43 34.4	32.2	9.515	46.07	2 49.58	15 54.12	1 5.94	2 31 59.49
May 1	2 32 58.51	58.05	+ 15 1 52.8	50.5	9.537	+ 45.46	− 2 57.51	15 53.89	1 6.02	2 35 56.05
2	2 36 47.67	47.18	15 19 56.4	54.0	9.559	44.83	3 4.91	15 53.65	1 6.10	2 39 52.60
3	2 40 37.36	36.85	15 37 44.7	42.3	9.582	44.18	3 11.78	15 53.42	1 6.18	2 43 49.16
4	2 44 27.59	27.06	15 55 17.5	15.1	9.605	43.53	3 18.11	15 53.19	1 6.26	2 47 45.71
5	2 48 18.38	17.83	16 12 34.5	32.1	9.628	42.87	3 23.89	15 52.96	1 6.34	2 51 42.27
6	2 52 9.72	9.16	+ 16 29 35.3	32.9	9.651	+ 42.19	− 3 29.10	15 52.73	1 6.42	2 55 38.82
7	2 56 1.63	1.06	16 46 19.7	17.3	9.675	41.50	3 33.73	15 52.51	1 6.50	2 59 35.38
8	2 59 54.12	53.54	17 2 47.4	44.9	9.699	40.80	3 37.80	15 52.28	1 6.58	3 3 31.94
9	3 3 47.19	46.60	17 18 58.0	55.5	9.723	40.08	3 41.29	15 52.06	1 6.67	3 7 28.49
10	3 7 40.84	40.25	17 34 51.5	49.1	9.747	39.36	3 44.19	15 51.84	1 6.75	3 11 25.05
11	3 11 35.09	34.49	+ 17 50 27.6	25.2	9.771	+ 38.63	− 3 46.49	15 51.62	1 6.83	3 15 21.60
12	3 15 29.94	29.33	18 5 45.9	43.4	9.796	37.88	3 48.20	15 51.41	1 6.91	3 19 18.16
13	3 19 25.38	24.76	18 20 46.0	43.6	9.821	37.12	3 49.32	15 51.20	1 6.99	3 23 14.72
14	3 23 21.42	20.79	18 35 27.7	25.4	9.846	36.34	3 49.84	15 50.99	1 7.07	3 27 11.27
15	3 27 18.05	17.42	18 49 50.6	48.4	9.871	35.56	3 49.78	15 50.78	1 7.15	3 31 7.83
16	3 31 15.26	14.63	+ 19 3 54.7	52.4	9.896	+ 34.76	− 3 49.14	15 50.58	1 7.24	3 35 4.38
17	3 35 13.04	12.42	+ 19 17 39.6	37.3	9.920	+ 33.95	− 3 47.92	15 50.38	1 7.32	3 39 0.94

Note.—For mean time interval of semidiameter passing meridian, subtract $0^{s}.18$ from the sidereal interval.

FOR WASHINGTON MEAN AND APPARENT NOON.

Date.	Apparent Right Ascension.		Apparent Declination.		Hourly Motion.		Equation of Time for Apparent Noon.	Semi-diameter at Apparent Noon.	Sidereal Time of Semid. Passing Meridian.	Sidereal Time of Mean Noon.
	Mean Noon.	App. Noon.	Mean Noon.	App. Noon.	Right Ascen.	Declination.				
	h m s	s	° ′ ″	″	s	″	m s	′ ″	m s	h m s
May 17	3 35 13.04	12.42	+19 17 39.6	37.3	9.920	+33.95	−3 47.92	15 50.38	1 7.32	3 39 0.94
18	3 39 11.40	10.78	19 31 4.8	2.7	9.944	33.13	3 46.11	15 50.19	1 7.40	3 42 57.50
19	3 43 10.32	9.70	19 44 10.2	8.1	9.967	32.30	3 43.74	15 50.00	1 7.48	3 46 54.05
20	3 47 9.79	9.18	19 56 55.5	53.5	9.990	31.46	3 40.82	15 49.82	1 7.56	3 50 50.61
21	3 51 9.80	9.20	20 9 20.4	18.5	10.012	30.59	3 37.37	15 49.64	1 7.63	3 54 47.17
22	3 55 10.34	9.74	+20 21 24.5	22.7	10.033	+29.72	−3 33.39	15 49.46	1 7.71	3 58 43.72
23	3 59 11.40	10.80	20 33 7.7	6.0	10.054	28.85	3 28.90	15 49.29	1 7.78	4 2 40.28
24	4 3 12.96	12.38	20 44 29.6	28.0	10.075	27.96	3 23.90	15 49.13	1 7.86	4 6 36.84
25	4 7 15.02	14.45	20 55 30.1	28.6	10.096	27.07	3 18.40	15 48.97	1 7.93	4 10 33.39
26	4 11 17.56	17.00	21 6 9.2	7.8	10.116	26.17	3 12.41	15 48.81	1 7.99	4 14 29.95
27	4 15 20.57	20.03	+21 16 26.4	25.1	10.135	+25.25	−3 5.96	15 48.66	1 8.06	4 18 26.51
28	4 19 24.03	23.52	21 26 21.5	20.3	10.154	24.32	2 59.06	15 48.51	1 8.13	4 22 23.07
29	4 23 27.94	27.45	21 35 54.2	53.1	10.172	23.39	2 51.70	15 48.37	1 8.19	4 26 19.62
30	4 27 32.29	31.82	21 45 4.3	3.3	10.190	22.45	2 43.90	15 48.22	1 8.26	4 30 16.18
31	4 31 37.06	36.61	21 53 51.8	50.9	10.207	21.50	2 35.69	15 48.08	1 8.32	4 34 12.74
June 1	4 35 42.23	41.81	+22 2 16.5	15.6	10.223	+20.54	−2 27.08	15 47.95	1 8.38	4 38 9.30
2	4 39 47.80	47.41	22 10 18.2	17.4	10.240	19.58	2 18.06	15 47.81	1 8.43	4 42 5.85
3	4 43 53.76	53.39	22 17 56.6	55.9	10.256	18.61	2 8.66	15 47.68	1 8.48	4 46 2.41
4	4 47 60.08	59.74	22 25 11.6	11.0	10.271	17.63	1 58.90	15 47.55	1 8.53	4 49 58.97
5	4 52 6.74	6.44	22 32 3.3	2.7	10.285	16.65	1 48.79	15 47.42	1 8.58	4 53 55.53
6	4 56 13.75	13.48	+22 38 31.3	30.9	10.299	+15.67	−1 38.33	15 47.30	1 8.62	4 57 52.08
7	5 0 21.09	20.85	22 44 35.6	35.3	10.312	14.68	1 27.54	15 47.19	1 8.66	5 1 48.64
8	5 4 28.74	28.52	22 50 16.1	15.8	10.325	13.69	1 16.45	15 47.07	1 8.70	5 5 45.20
9	5 8 36.69	36.49	22 55 32.6	32.4	10.337	12.68	1 5.07	15 46.96	1 8.74	5 9 41.76
10	5 12 44.92	44.76	23 0 25.0	24.9	10.348	11.67	0 53.41	15 46.85	1 8.77	5 13 38.30
11	5 16 53.40	53.28	+23 4 53.1	53.0	10.358	+10.66	−0 41.48	15 46.74	1 8.80	5 17 34.87
12	5 21 2.10	2.01	23 8 57.0	56.9	10.368	9.64	0 29.33	15 46.64	1 8.83	5 21 31.43
13	5 25 11.02	10.96	23 12 36.5	36.5	10.376	8.63	0 16.97	15 46.54	1 8.86	5 25 27.99
14	5 29 20.13	20.11	23 15 51.5	51.6	10.383	7.61	−0 4.42	15 46.45	1 8.87	5 29 24.55
15	5 33 29.39	29.42	23 18 41.9	42.0	10.389	6.58	+0 8.29	15 46.36	1 8.89	5 33 21.10
16	5 37 38.80	38.86	+23 21 7.6	7.6	10.394	+ 5.55	+0 21.14	15 46.28	1 8.91	5 37 17.66
17	5 41 48.31	48.40	23 23 8.6	8.6	10.398	4.52	0 34.10	15 46.20	1 8.92	5 41 14.22
18	5 45 57.89	58.03	23 24 44.8	44.9	10.400	3.49	0 47.12	15 46.14	1 8.93	5 45 10.78
19	5 50 7.52	7.70	23 25 56.2	56.3	10.402	2.45	1 0.19	15 46.08	1 8.94	5 49 7.34
20	5 54 17.17	17.38	23 26 42.8	42.9	10.402	1.42	1 13.28	15 46.02	1 8.94	5 53 3.89
21	5 58 26.83	27.06	+23 27 4.6	4.7	10.401	+ 0.39	+1 26.37	15 45.97	1 8.94	5 57 0.45
22	6 2 36.45	36.72	23 27 1.5	1.6	10.399	− 0.65	1 39.44	15 45.92	1 8.94	6 0 57.01
23	6 6 46.00	46.31	23 26 33.6	33.6	10.396	1.68	1 52.44	15 45.87	1 8.93	6 4 53.57
24	6 10 55.47	55.81	23 25 40.9	40.9	10.392	2.72	2 5.35	15 45.83	1 8.92	6 8 50.13
25	6 15 4.83	5.22	23 24 23.4	23.4	10.388	3.75	2 18.16	15 45.80	1 8.91	6 12 46.68
26	6 19 14.06	14.50	+23 22 41.2	41.1	10.382	− 4.78	+2 30.84	15 45.78	1 8.89	6 16 43.24
27	6 23 23.14	23.61	23 20 34.3	34.1	10.374	5.81	2 43.37	15 45.76	1 8.87	6 20 39.80
28	6 27 32.04	32.54	23 18 2.8	2.5	10.366	6.83	2 55.71	15 45.74	1 8.84	6 24 36.36
29	6 31 40.74	41.27	23 15 6.8	6.4	10.357	7.85	3 7.85	15 45.72	1 8.81	6 28 32.92
30	6 35 49.22	49.78	23 11 46.4	45.9	10.348	8.87	3 19.77	15 45.70	1 8.78	6 32 29.47
July 1	6 39 57.46	58.06	+23 8 1.6	1.0	10.338	− 9.88	+3 31.45	15 45.69	1 8.74	6 36 26.03
2	6 44 5.45	6.09	+23 3 52.6	51.9	10.328	−10.88	+3 42.88	15 45.69	1 8.70	6 40 22.59

NOTE.—For mean time interval of semidiameter passing meridian, subtract $0^s.19$ from the sidereal interval.

FOR WASHINGTON MEAN AND APPARENT NOON.

Date.		Apparent Right Ascension.		Apparent Declination.		Hourly Motion.		Equation of Time for Apparent Noon.	Semi-diameter at Apparent Noon.	Sidereal Time of Semid. Passing Meridian.	Sidereal Time of Mean Noon.
		Mean Noon.	App. Noon.	Mean Noon.	App. Noon.	Right Ascen.	Declination.				
		h m s	s	° ′ ″	″	s	″	m s	′ ″	m s	h m s
July	1	6 39 57.46	58.06	+23 8 1.6	1.0	10.338	− 9.88	+ 3 31.45	15 45.69	1 8.74	6 36 26.03
	2	6 44 5.45	6.09	23 3 52.6	51.9	10.328	10.88	3 42.88	15 45.69	1 8.70	6 40 22.59
	3	6 48 13.16	13.84	22 59 19.4	18.7	10.316	11.88	3 54.05	15 45.68	1 8.67	6 44 19.15
	4	6 52 20.59	21.30	22 54 22.1	21.3	10.303	12.88	4 4.92	15 45.68	1 8.64	6 48 15.71
	5	6 56 27.71	28.44	22 49 0.9	0.0	10.290	13.88	4 15.48	15 45.69	1 8.60	6 52 12.26
	6	7 0 34.51	35.26	+22 43 16.0	15.0	10.276	−14.87	+ 4 25.71	15 45.69	1 8.55	6 56 8.82
	7	7 4 40.97	41.74	22 37 7.5	6.3	10.262	15.85	4 35.60	15 45.70	1 8.50	7 0 5.38
	8	7 8 47.08	47.88	22 30 35.5	34.2	10.247	16.83	4 45.16	15 45.71	1 8.45	7 4 1.94
	9	7 12 52.82	53.65	22 23 40.1	38.7	10.232	17.80	4 54.35	15 45.73	1 8.40	7 7 58.49
	10	7 16 58.18	59.04	22 16 21.5	19.9	10.215	18.76	5 3.16	15 45.76	1 8.34	7 11 55.05
	11	7 21 3.14	4.03	+22 8 39.8	38.1	10.198	−19.71	+ 5 11.56	15 45.79	1 8.28	7 15 51.61
	12	7 25 7.68	8.59	22 0 35.3	33.5	10.180	20.66	5 19.54	15 45.82	1 8.21	7 19 48.17
	13	7 29 11.79	12.72	21 52 8.1	6.2	10.162	21.60	5 27.10	15 45.85	1 8.15	7 23 44.72
	14	7 33 15.45	16.39	21 43 18.4	16.3	10.142	22.54	5 34.20	15 45.89	1 8.08	7 27 41.28
	15	7 37 18.63	19.59	21 34 6.4	4.2	10.122	23.47	5 40.82	15 45.94	1 8.01	7 31 37.84
	16	7 41 21.32	22.30	+21 24 32.3	30.1	10.102	−24.38	+ 5 46.95	15 45.99	1 7.94	7 35 34.40
	17	7 45 23.51	24.50	21 14 36.4	34.1	10.081	25.28	5 52.58	15 46.05	1 7.86	7 39 30.95
	18	7 49 25.17	26.17	21 4 18.8	16.3	10.059	26.18	5 57.68	15 46.11	1 7.78	7 43 27.51
	19	7 53 26.29	27.30	20 53 39.7	37.0	10.036	27.08	6 2.24	15 46.18	1 7.71	7 47 24.07
	20	7 57 26.85	27.87	20 42 39.5	36.7	10.012	27.95	6 6.25	15 46.25	1 7.63	7 51 20.62
	21	8 1 26.85	27.88	+20 31 18.3	15.5	9.988	−28.81	+ 6 9.69	15 46.34	1 7.55	7 55 17.18
	22	8 5 26.28	27.32	20 19 36.5	33.6	9.964	29.67	6 12.56	15 46.42	1 7.47	7 59 13.74
	23	8 9 25.13	26.17	20 7 34.3	31.2	9.940	30.52	6 14.85	15 46.51	1 7.39	8 3 10.29
	24	8 13 23.38	24.42	19 55 11.8	8.6	9.915	31.35	6 16.54	15 46.60	1 7.31	8 7 6.85
	25	8 17 21.02	22.06	19 42 29.5	26.2	9.890	32.17	6 17.62	15 46.70	1 7.23	8 11 3.41
	26	8 21 18.06	19.10	+19 29 27.7	24.3	9.865	−32.98	+ 6 18.10	15 46.81	1 7.14	8 14 59.96
	27	8 25 14.50	15.53	19 16 6.4	2.9	9.839	33.78	6 17.97	15 46.92	1 7.06	8 18 56.52
	28	8 29 10.31	11.33	19 2 26.0	22.4	9.813	34.57	6 17.23	15 47.03	1 6.97	8 22 53.08
	29	8 33 5.50	6.51	18 48 26.8	23.1	9.786	35.35	6 15.87	15 47.14	1 6.89	8 26 49.63
	30	8 37 0.08	1.08	18 34 9.1	5.4	9.761	36.11	6 13.89	15 47.25	1 6.80	8 30 46.19
	31	8 40 54.06	55.05	+18 19 33.1	29.4	9.736	−36.87	+ 6 11.29	15 47.37	1 6.71	8 34 42.75
Aug.	1	8 44 47.42	48.40	18 4 39.2	35.4	9.712	37.61	6 8.09	15 47.50	1 6.62	8 38 39.30
	2	8 48 40.17	41.14	17 49 27.7	23.8	9.686	38.34	6 4.29	15 47.63	1 6.53	8 42 35.86
	3	8 52 32.32	33.28	17 33 58.8	54.9	9.661	39.06	5 59.89	15 47.76	1 6.44	8 46 32.41
	4	8 56 23.88	24.82	17 18 12.6	8.8	9.636	39.77	5 54.89	15 47.89	1 6.35	8 50 28.97
	5	9 0 14.85	15.77	+17 2 9.6	5.8	9.612	−40.48	+ 5 49.31	15 48.02	1 6.27	8 54 25.53
	6	9 4 5.25	6.14	16 45 50.1	46.2	9.588	41.16	5 43.15	15 48.15	1 6.18	8 58 22.09
	7	9 7 55.07	55.95	16 29 14.3	10.4	9.564	41.83	5 36.41	15 48.29	1 6.10	9 2 18.64
	8	9 11 44.32	45.19	16 12 22.4	18.6	9.540	42.49	5 29.11	15 48.43	1 6.01	9 6 15.19
	9	9 15 33.00	33.86	15 55 14.7	10.9	9.517	43.15	5 21.24	15 48.58	1 5.93	9 10 11.75
	10	9 19 21.13	21.96	+15 37 51.6	47.8	9.494	−43.78	+ 5 12.80	15 48.73	1 5.84	9 14 8.30
	11	9 23 8.71	9.51	15 20 13.5	9.7	9.471	44.40	5 3.81	15 48.89	1 5.76	9 18 4.86
	12	9 26 55.73	56.50	15 2 20.5	16.8	9.448	45.01	4 54.28	15 49.06	1 5.68	9 22 1.41
	13	9 30 42.20	42.94	14 44 13.0	9.4	9.425	45.61	4 44.20	15 49.23	1 5.60	9 25 57.97
	14	9 34 28.13	28.84	14 25 51.3	47.8	9.402	46.19	4 33.58	15 49.40	1 5.52	9 29 54.52
	15	9 38 13.53	14.21	+14 7 15.7	12.4	9.379	−46.76	+ 4 22.42	15 49.57	1 5.44	9 33 51.08
	16	9 41 58.39	59.04	+13 48 26.6	23.4	9.358	−47.32	+ 4 10.72	15 49.75	1 5.36	9 37 47.63

Note.—For mean time interval of semidiameter passing meridian, subtract 0^s.19 from the sidereal interval.

FOR WASHINGTON MEAN AND APPARENT NOON.

Date.	Apparent Right Ascension.		Apparent Declination.		Hourly Motion.		Equation of Time for Apparent Noon.	Semi-diameter at Apparent Noon.	Sidereal Time of Semid. Passing Meridian.	Sidereal Time of Mean Noon.
	Mean Noon.	App. Noon.	Mean Noon.	App. Noon.	Right Ascen.	Declination.				
	h m s	s	° ′ ″	″	s	″	m s	′ ″	m s	h m s
Aug. 16	9 41 58.39	59.04	+ 13 48 26.6	23.4	9.358	− 47.32	+ 4 10.72	15 49.75	1 5.36	9 37 47.63
17	9 45 42.72	43.34	13 29 24.4	21.2	9.336	47.86	3 58.50	15 49.93	1 5.28	9 41 44.19
18	9 49 26.53	27.12	13 10 9.3	6.2	9.314	48.39	3 45.76	15 50.12	1 5.21	9 45 40.74
19	9 53 9.84	10.39	12 50 41.7	38.7	9.294	48.91	3 32.51	15 50.31	1 5.14	9 49 37.30
20	9 56 52.65	53.16	12 30 61.9	59.1	9.274	49.40	3 18.77	15 50.50	1 5.08	9 53 33.85
21	10 0 34.97	35.44	+ 12 11 10.2	7.6	9.253	− 49.89	+ 3 4.53	15 50.70	1 5.01	9 57 30.41
22	10 4 16.80	17.23	11 51 6.9	4.5	9.233	50.37	2 49.81	15 50.90	1 4.94	10 1 26.96
23	10 7 58.16	58.55	11 30 52.4	50.2	9.214	50.84	2 34.61	15 51.11	1 4.88	10 5 23.52
24	10 11 39.07	39.42	11 10 27.0	25.0	9.195	51.28	2 18.96	15 51.33	1 4.81	10 9 20.07
25	10 15 19.54	19.85	10 49 51.1	49.3	9.177	51.71	2 2.88	15 51.55	1 4.75	10 13 16.63
26	10 18 59.58	59.85	+ 10 29 5.1	3.5	9.160	− 52.13	+ 1 46.38	15 51.76	1 4.69	10 17 13.18
27	10 22 39.21	39.44	10 8 9.2	7.8	9.143	52.53	1 29.46	15 51.98	1 4.64	10 21 9.73
28	10 26 18.45	18.63	9 47 3.6	2.5	9.127	52.92	1 12.15	15 52.20	1 4.58	10 25 6.29
29	10 29 57.31	57.45	9 25 48.7	47.9	9.112	53.30	0 54.46	15 52.42	1 4.53	10 29 2.84
30	10 33 35.81	35.91	9 4 24.9	24.3	9.097	53.67	0 36.41	15 52.64	1 4.48	10 32 59.40
31	10 37 13.98	14.04	+ 8 42 52.5	52.1	9.084	− 54.02	+ 0 18.03	15 52.87	1 4.43	10 36 55.95
Sept. 1	10 40 51.84	51.85	8 21 11.7	11.6	9.072	54.37	− 0 0.65	15 53.09	1 4.38	10 40 52.50
2	10 44 29.41	29.36	7 59 22.9	23.1	9.060	54.70	0 19.65	15 53.32	1 4.34	10 44 49.06
3	10 48 6.70	6.60	7 37 26.3	26.8	9.049	55.02	0 38.91	15 53.55	1 4.29	10 48 45.61
4	10 51 43.74	43.59	7 15 22.1	22.9	9.038	55.32	0 58.41	15 53.78	1 4.25	10 52 42.16
5	10 55 20.55	20.36	+ 6 53 10.8	11.9	9.029	− 55.62	− 1 18.14	15 54.01	1 4.21	10 56 38.72
6	10 58 57.16	56.92	6 30 52.6	54.1	9.021	55.90	1 38.08	15 54.24	1 4.18	11 0 35.27
7	11 2 33.57	33.28	6 8 27.8	29.7	9.014	56.16	1 58.22	15 54.48	1 4.15	11 4 31.83
8	11 6 9.81	9.46	5 45 56.9	59.0	9.007	56.41	2 18.54	15 54.72	1 4.13	11 8 28.38
9	11 9 45.88	45.48	5 23 20.1	22.5	9.000	56.66	2 39.02	15 54.96	1 4.11	11 12 24.93
10	11 13 21.81	21.36	+ 5 0 37.6	40.4	8.994	− 56.88	− 2 59.63	15 55.20	1 4.09	11 16 21.48
11	11 16 57.61	57.11	4 37 49.9	53.0	8.989	57.09	3 20.37	15 55.45	1 4.07	11 20 18.04
12	11 20 33.31	32.76	4 14 57.3	60.7	8.985	57.29	3 41.22	15 55.70	1 4.05	11 24 14.59
13	11 24 8.91	8.31	3 52 0.2	3.9	8.981	57.47	4 2.17	15 55.96	1 4.04	11 28 11.15
14	11 27 44.44	43.79	3 28 58.9	62.9	8.978	57.64	4 23.19	15 56.22	1 4.03	11 32 7.70
15	11 31 19.90	19.20	+ 3 5 53.7	58.1	8.977	− 57.80	− 4 44.27	15 56.48	1 4.02	11 36 4.25
16	11 34 55.33	54.56	2 42 45.0	49.8	8.976	57.94	5 5.40	15 56.74	1 4.02	11 40 0.80
17	11 38 30.73	29.90	2 19 33.2	38.4	8.975	58.06	5 26.56	15 57.00	1 4.02	11 43 57.36
18	11 42 6.11	5.23	1 56 18.7	24.2	8.975	58.16	5 47.73	15 57.26	1 4.02	11 47 53.91
19	11 45 41.50	40.57	1 33 1.7	7.6	8.975	58.26	6 8.88	15 57.53	1 4.02	11 51 50.46
20	11 49 16.92	15.95	+ 1 9 42.7	48.9	8.976	− 58.33	− 6 30.00	15 57.80	1 4.03	11 55 47.02
21	11 52 52.39	51.37	0 46 22.0	28.6	8.979	58.39	6 51.08	15 58.07	1 4.04	11 59 43.57
22	11 56 27.92	26.84	+ 0 23 0.0	7.0	8.982	58.44	7 12.10	15 58.34	1 4.05	12 3 40.12
23	12 0 3.53	2.39	− 0 0 23.1	15.8	8.986	58.48	7 33.04	15 58.62	1 4.06	12 7 36.68
24	12 3 39.24	38.06	0 23 46.9	39.3	8.991	58.50	7 53.88	15 58.90	1 4.08	12 11 33.23
25	12 7 15.08	13.85	− 0 47 11.0	3.0	8.997	− 58.51	− 8 14.59	15 59.18	1 4.11	12 15 29.79
26	12 10 51.06	49.78	1 10 35.0	26.7	9.003	58.50	8 35.15	15 59.46	1 4.14	12 19 26.34
27	12 14 27.22	25.89	1 33 58.6	50.0	9.011	58.47	8 55.54	15 59.73	1 4.17	12 23 22.89
28	12 18 3.59	2.20	1 57 21.6	12.6	9.020	58.43	9 15.72	16 0.00	1 4.20	12 27 19.44
29	12 21 40.17	38.72	2 20 43.6	34.3	9.030	58.39	9 35.68	16 0.28	1 4.23	12 31 15.99
30	12 25 16.98	15.48	− 2 43 64.3	54.7	9.040	− 58.33	− 9 55.41	16 0.56	1 4.27	12 35 12.55
Oct. 1	12 28 54.06	52.51	− 3 7 23.4	13.5	9.052	− 58.25	− 10 14.88	16 0.84	1 4.32	12 39 9.10

Note.—For mean time interval of semidiameter passing meridian, subtract $0^s.18$ from the sidereal interval.

FOR WASHINGTON MEAN AND APPARENT NOON.

Date.	Apparent Right Ascension.		Apparent Declination.		Hourly Motion.		Equation of Time for Apparent Noon.	Semi-diameter at Apparent Noon.	Sidereal Time of Semid. Passing Meridian.	Sidereal Time of Mean Noon.
	Mean Noon.	App. Noon.	Mean Noon.	App. Noon.	Right Ascen.	Decli-nation.				
	h m s	s	° ′ ″	″	s	″	m s	′ ″	m s	h m s
Oct. 1	12 28 54.06	52.51	− 3 7 23.4	13.5	9.052	−58.25	− 10 14.88	16 0.84	1 4.32	12 39 9.10
2	12 32 31.46	29.86	3 30 40.5	30.3	9.065	58.17	10 34.05	16 1.11	1 4.37	12 43 5.66
3	12 36 9.18	7.53	3 53 55.3	44.8	9.078	58.06	10 52.88	16 1.38	1 4.41	12 47 2.21
4	12 39 47.24	45.55	4 17 7.5	56.7	9.093	57.94	11 11.37	16 1.65	1 4.45	12 50 58.76
5	12 43 25.66	23.93	4 40 16.8	5.7	9.108	57.81	11 29.50	16 1.92	1 4.50	12 54 55.31
6	12 47 4.46	2.68	− 5 3 22.7	11.4	9.125	−57.67	− 11 47.26	16 2.19	1 4.55	12 58 51.87
7	12 50 43.66	41.83	5 26 25.0	13.4	9.142	57.50	12 4.62	16 2.47	1 4.61	13 2 48.42
8	12 54 23.29	21.40	5 49 23.3	11.4	9.160	57.33	12 21.55	16 2.74	1 4.67	13 6 44.98
9	12 58 3.35	1.42	6 12 17.2	5.2	9.178	57.15	12 38.03	16 3.01	1 4.73	13 10 41.53
10	13 1 43.87	41.90	6 34 66.3	54.1	9.198	56.94	12 54.06	16 3.28	1 4.80	13 14 38.08
11	13 5 24.88	22.86	− 6 57 50.1	37.7	9.218	−56.72	− 13 9.62	16 3.55	1 4.87	13 18 34.63
12	13 9 6.38	4.31	7 20 28.4	15.8	9.239	56.47	13 24.69	16 3.82	1 4.94	13 22 31.19
13	13 12 48.37	46.26	7 43 0.8	47.9	9.260	56.21	13 39.24	16 4.10	1 5.02	13 26 27.74
14	13 16 30.88	28.74	8 5 26.7	13.7	9.283	55.94	13 53.28	16 4.37	1 5.10	13 30 24.30
15	13 20 13.94	11.76	8 27 45.9	32.8	9.306	55.65	14 6.78	16 4.64	1 5.19	13 34 20.85
16	13 23 57.56	55.33	− 8 49 58.0	44.8	9.329	−55.34	− 14 19.72	16 4.92	1 5.27	13 38 17.40
17	13 27 41.74	39.47	9 11 62.5	49.2	9.353	55.02	14 32.09	16 5.20	1 5.35	13 42 13.96
18	13 31 26.50	24.19	9 33 58.9	45.5	9.378	54.68	14 43.89	16 5.47	1 5.44	13 46 10.51
19	13 35 11.85	9.51	9 55 46.9	33.4	9.403	54.31	14 55.09	16 5.75	1 5.53	13 50 7.06
20	13 38 57.82	55.44	10 17 26.2	12.6	9.429	53.94	15 5.69	16 6.03	1 5.62	13 54 3.62
21	13 42 44.41	42.00	− 10 38 56.3	42.6	9.455	−53.55	− 15 15.66	16 6.30	1 5.71	13 58 0.17
22	13 46 31.65	29.21	11 0 16.8	3.1	9.482	53.14	15 24.98	16 6.58	1 5.81	14 1 56.73
23	13 50 19.54	17.07	11 21 27.2	13.5	9.509	52.72	15 33.65	16 6.85	1 5.91	14 5 53.28
24	13 54 8.09	5.60	11 42 27.2	13.5	9.537	52.28	15 41.66	16 7.12	1 6.01	14 9 49.84
25	13 57 57.33	54.81	12 3 16.4	2.7	9.566	51.81	15 48.98	16 7.39	1 6.11	14 13 46.39
26	14 1 47.27	44.73	− 12 23 54.5	40.8	9.596	−51.34	− 15 55.60	16 7.66	1 6.22	14 17 42.95
27	14 5 37.93	35.36	12 45 21.0	7.4	9.626	50.85	16 1.50	16 7.92	1 6.32	14 21 39.50
28	14 9 29.33	26.73	13 4 35.6	22.0	9.658	50.35	16 6.67	16 8.18	1 6.43	14 25 36.05
29	14 13 21.48	18.86	13 24 37.9	24.4	9.690	49.85	16 11.08	16 8.44	1 6.54	14 29 32.61
30	14 17 14.41	11.77	13 44 27.5	14.1	9.722	49.31	16 14.72	16 8.69	1 6.65	14 33 29.16
31	14 21 8.12	5.47	− 14 3 64.1	50.8	9.754	−48.75	− 16 17.58	16 8.94	1 6.76	14 37 25.72
Nov. 1	14 24 62.63	59.97	14 23 27.2	14.0	9.788	48.16	16 19.63	16 9.18	1 6.88	14 41 22.27
2	14 28 57.95	55.28	14 42 36.5	23.4	9.822	47.58	16 20.87	16 9.43	1 6.99	14 45 18.83
3	14 32 54.10	51.42	15 1 31.5	18.6	9.856	46.99	16 21.29	16 9.67	1 7.11	14 49 15.38
4	14 36 51.08	48.39	15 19 71.9	59.2	9.891	46.37	16 20.88	16 9.91	1 7.23	14 53 11.94
5	14 40 48.90	46.19	− 15 38 37.5	24.9	9.926	−45.73	− 16 19.63	16 10.14	1 7.35	14 57 8.49
6	14 44 47.55	44.84	15 56 47.7	35.3	9.962	45.08	16 17.54	16 10.38	1 7.47	15 1 5.05
7	14 48 47.06	44.35	16 14 42.0	29.9	9.998	44.41	16 14.60	16 10.61	1 7.59	15 5 1.61
8	14 52 47.43	44.72	16 32 20.0	8.1	10.034	43.73	16 10.79	16 10.84	1 7.71	15 8 58.16
9	14 56 48.65	45.94	16 49 41.3	29.6	10.069	43.03	16 6.13	16 11.07	1 7.83	15 12 54.72
10	15 0 50.72	48.02	− 17 6 45.5	34.1	10.105	−42.30	− 16 0.62	16 11.30	1 7.95	15 16 51.27
11	15 4 53.65	50.96	17 23 32.3	21.2	10.140	41.57	15 54.25	16 11.52	1 8.07	15 20 47.83
12	15 8 57.44	54.76	17 39 61.1	50.3	10.176	40.82	15 47.03	16 11.74	1 8.19	15 24 44.39
13	15 12 62.09	59.42	17 56 11.5	1.0	10.211	40.04	15 38.95	16 11.96	1 8.31	15 28 40.94
14	15 17 7.58	4.93	18 11 63.2	53.0	10.246	39.25	15 30.03	16 12.18	1 8.43	15 32 37.50
15	15 21 13.91	11.28	− 18 27 35.7	25.8	10.281	−38.44	− 15 20.26	16 12.39	1 8.55	15 36 34.06
16	15 25 21.08	18.47	− 18 42 48.6	39.1	10.316	−37.62	− 15 9.66	16 12.60	1 8.67	15 40 30.62

NOTE.—For mean time interval of semidiameter passing meridian, subtract $0^s.19$ from the sidereal interval.

FOR WASHINGTON MEAN AND APPARENT NOON.

Date.	Apparent Right Ascension.		Apparent Declination.		Hourly Motion.		Equation of Time for Apparent Noon.	Semi-diameter at Apparent Noon.	Sidereal Time of Semid. Passing Meridian.	Sidereal Time of Mean Noon.
	Mean Noon.	App. Noon.	Mean Noon.	App. Noon.	Right Ascen.	Decli-nation.				
	h m s	s	° ′ ″	″	s	″	m s	′ ″	m s	h m s
Nov. 16	15 25 21.08	18.47	− 18 42 48.6	39.1	10.316	−37.62	− 15 9.66	16 12.60	1 8.67	15 40 30.62
17	15 29 29.06	26.49	18 57 41.5	32.3	10.350	36.78	14 58.24	16 12.81	1 8.78	15 44 27.17
18	15 33 37.87	35.32	19 12 14.1	5.1	10.384	35.91	14 45.99	16 13.02	1 8.89	15 48 23.73
19	15 37 47.50	44.97	19 26 25.9	17.2	10.418	35.04	14 32.93	16 13.23	1 9.00	15 52 20.28
20	15 41 57.92	55.42	19 40 16.6	8.2	10.451	34.15	14 19.07	16 13.43	1 9.11	15 56 16.84
21	15 46 9.14	6.67	− 19 53 45.7	37.7	10.484	−33.24	− 14 4.42	16 13.63	1 9.22	16 0 13.40
22	15 50 21.15	18.71	20 6 52.8	45.2	10.517	32.32	13 48.98	16 13.83	1 9.33	16 4 9.95
23	15 54 33.92	31.53	20 19 37.7	30.5	10.549	31.39	13 32.76	16 14.02	1 9.44	16 8 6.51
24	15 58 47.45	45.11	20 31 60.2	53.4	10.580	30.45	13 15.77	16 14.21	1 9.55	16 12 3.07
25	16 3 1.75	59.45	20 43 59.7	53.3	10.611	29.49	12 58.03	16 14.40	1 9.66	16 15 59.62
26	16 7 16.79	14.54	− 20 55 36.0	29.9	10.642	−28.52	− 12 39.55	16 14.58	1 9.77	16 19 56.18
27	16 11 32.56	30.36	21 6 48.8	43.0	10.672	27.54	12 20.34	16 14.74	1 9.87	16 23 52.74
28	16 15 49.06	46.91	21 17 37.8	32.4	10.702	26.53	12 0.41	16 14.90	1 9.97	16 27 49.30
29	16 20 6.27	4.18	21 27 62.6	57.6	10.732	25.52	11 39.76	16 15.06	1 10.06	16 31 45.86
30	16 24 24.18	22.14	21 37 63.0	58.4	10.761	24.50	11 18.41	16 15.22	1 10.15	16 35 42.42
Dec. 1	16 28 42.77	40.79	− 21 47 38.8	34.6	10.789	−23.47	− 10 56.38	16 15.37	1 10.24	16 39 38.97
2	16 33 2.02	0.11	21 56 49.7	45.8	10.816	22.42	10 33.69	16 15.52	1 10.33	16 43 35.53
3	16 37 21.92	20.07	22 5 35.2	31.6	10.842	21.36	10 10.35	16 15.66	1 10.41	16 47 32.09
4	16 41 42.44	40.66	22 13 55.2	52.0	10.866	20.30	9 46.38	16 15.80	1 10.49	16 51 28.65
5	16 46 3.56	1.85	22 21 49.5	46.6	10.891	19.22	9 21.81	16 15.93	1 10.57	16 55 25.20
6	16 50 25.27	23.61	− 22 29 17.8	15.2	10.914	− 18.13	− 8 56.67	16 16.05	1 10.64	16 59 21.76
7	16 54 47.46	45.92	22 36 19.7	17.4	10.936	17.02	8 30.99	16 16.17	1 10.70	17 3 18.32
8	16 59 10.21	8.75	22 42 55.1	53.0	10.957	15.91	8 4.79	16 16.29	1 10.77	17 7 14.88
9	17 3 33.46	32.06	22 49 3.7	1.8	10.977	14.79	7 38.11	16 16.41	1 10.83	17 11 11.44
10	17 7 57.15	55.83	22 54 45.5	43.7	10.996	13.67	7 10.97	16 16.52	1 10.89	17 15 8.00
11	17 12 21.26	20.03	− 22 59 60.1	58.6	11.013	− 12.53	− 6 43.41	16 16.63	1 10.94	17 19 4.55
12	17 16 45.77	44.62	23 4 47.3	46.1	11.028	11.38	6 15.46	16 16.74	1 10.99	17 23 1.11
13	17 21 10.63	9.56	23 9 7.0	6.0	11.042	10.23	5 47.15	16 16.84	1 11.04	17 26 57.67
14	17 25 35.81	34.83	23 12 59.1	58.3	11.055	9.08	5 18.52	16 16.94	1 11.08	17 30 54.23
15	17 30 1.28	0.39	23 16 23.4	22.8	11.066	7.92	4 49.60	16 17.04	1 11.12	17 34 50.79
16	17 34 27.00	26.20	− 23 19 19.7	19.2	11.076	− 6.76	− 4 20.43	16 17.13	1 11.15	17 38 47.35
17	17 38 52.92	52.21	23 21 48.0	47.6	11.083	5.58	3 51.05	16 17.22	1 11.18	17 42 43.90
18	17 43 19.02	18.40	23 23 48.2	47.9	11.090	4.41	3 21.50	16 17.30	1 11.20	17 46 40.46
19	17 47 45.26	44.73	23 25 20.2	20.1	11.096	3.24	2 51.82	16 17.38	1 11.22	17 50 37.02
20	17 52 11.60	11.16	23 26 24.0	23.9	11.099	2.06	2 22.03	16 17.45	1 11.24	17 54 33.58
21	17 56 38.01	37.66	− 23 26 59.5	59.4	11.101	− 0.88	− 1 52.16	16 17.51	1 11.25	17 58 30.14
22	18 1 4.46	4.21	23 27 6.7	6.7	11.102	+ 0.29	1 22.26	16 17.57	1 11.26	18 2 26.70
23	18 5 30.90	30.76	23 26 45.6	45.6	11.101	1.47	0 52.36	16 17.63	1 11.26	18 6 23.26
24	18 9 57.30	57.26	23 25 56.2	56.2	11.099	2.65	− 0 22.49	16 17.69	1 11.26	18 10 19.82
25	18 14 23.65	23.69	23 24 38.6	38.6	11.096	3.82	+ 0 7.31	16 17.73	1 11.25	18 14 16.37
26	18 18 49.92	50.04	− 23 22 52.8	52.8	11.092	+ 4.99	+ 0 37.02	16 17.77	1 11.24	18 18 12.93
27	18 23 16.08	16.27	23 20 38.8	38.7	11.087	6.17	1 6.61	16 17.81	1 11.23	18 22 9.49
28	18 27 42.09	42.37	23 17 56.7	56.5	11.080	7.34	1 36.07	16 17.83	1 11.21	18 26 6.05
29	18 32 7.93	8.31	23 14 46.7	46.4	11.072	8.51	2 5.36	16 17.85	1 11.18	18 30 2.61
30	18 36 33.56	34.04	23 11 8.7	8.3	11.063	9.67	2 34.45	16 17.87	1 11.14	18 33 59.17
31	18 40 58.96	59.53	− 23 7 2.8	2.3	11.053	+ 10.83	+ 3 3.31	16 17.88	1 11.10	18 37 55.73
32	18 45 24.11	24.76	− 23 2 29.3	28.6	11.042	+ 11.97	+ 3 31.90	16 17.88	1 11.06	18 41 52.28

Note.—For mean time interval of semidiameter passing meridian, subtract $0^s.19$ from the sidereal interval.

AT TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

Date.		Mean Time of Transit.	Diff. for 1 Hour of Long.	Right Ascension of Center.	Diff. for 1 Hour of Long.	Geocentric Declination of Center.	Diff. for 1 Hour of Long.	Sid. Time of Semid. Passing Meridian.	Geocentric Semi-diameter.	Equatorial Horizontal Parallax.	Bright Limbs.
		h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″	
Jan.	1	8 17.73	2.067	3 1 54.91	134.22	+ 13 43 45.1	+ 724.5	67.22	15 44.3	57 39.9	I. S.
	2	9 8.12	2.134	3 56 23.19	138.24	18 7 11.5	586.4	68.19	15 36.2	57 10.0	I. S.
	3	10 0.13	2.198	4 52 29.23	142.10	21 28 18.1	414.0	69.11	15 28.0	56 39.9	I. S.
	4	10 53.40	2.234	5 49 50.30	144.26	23 35 14.5	217.7	69.59	15 19.8	56 9.8	I. N. S.
	5	11 46.97	2.222	6 47 29.92	143.52	24 21 21.1	+ 12.9	69.39	15 11.8	55 40.5	I. N. S.
	6	12 39.62	2.158	7 44 14.42	139.72	+ 23 46 48.3	− 182.7	68.44	15 4.2	55 12.5	II. N. S.
	7	13 30.27	2.057	8 38 57.98	133.64	21 58 25.8	354.3	66.90	14 57.4	54 47.5	II. N. S.
	8	14 18.27	1.942	9 31 2.39	126.70	19 7 37.1	494.2	65.14	14 51.7	54 26.9	II. S.
	9	15 3.54	1.834	10 20 23.06	120.21	15 27 31.9	601.0	63.46	14 47.8	54 12.6	II. S.
	10	15 46.49	1.750	11 7 23.32	115.13	11 10 52.7	677.7	62.14	14 46.0	54 6.0	II. S.
	11	16 27.80	1.699	11 52 45.23	112.09	+ 6 28 53.5	− 728.2	61.35	14 46.8	54 8.6	II. S.
	12	17 8.36	1.688	12 37 22.09	111.42	+ 1 31 20.7	755.7	61.21	14 50.3	54 21.5	II. S.
	13	17 49.17	1.720	13 22 14.04	113.37	− 3 32 44.3	760.7	61.78	14 56.7	54 45.2	II. S.
	14	18 31.31	1.799	14 8 26.01	118.10	8 33 57.5	740.6	63.09	15 6.1	55 19.6	II. S.
	15	19 15.90	1.924	14 57 5.43	125.64	13 21 6.2	688.9	65.11	15 18.2	56 3.8	II. S.
	16	20 4.02	2.091	15 49 17.03	135.68	− 17 39 41.1	− 596.0	67.69	15 32.3	56 55.8	II. S.
	17	20 56.49	2.282	16 45 50.19	147.18	21 10 57.2	450.8	70.54	15 47.8	57 52.5	II. S.
	18	21 53.50	2.463	17 46 56.77	158.02	23 32 32.8	− 247.5	73.12	16 3.2	58 49.0	II. S.
	19	22 54.22	2.583	18 51 46.51	165.28	24 22 20.9	+ 5.0	74.79	16 17.0	59 39.9	II. N.
	20	23 56.71	2.606	19 58 22.66	166.67	23 25 39.6	278.5	75.09	16 27.8	60 19.3	
	22	0 58.54	2.532	21 4 18.91	162.19	− 20 42 7.5	+ 532.4	74.04	16 34.1	60 42.6	
	23	1 57.78	2.400	22 7 39.69	154.21	16 27 3.8	731.8	72.16	16 35.5	60 47.6	I. S.
	24	2 53.64	2.258	23 7 36.94	145.69	11 6 12.9	860.2	70.12	16 32.0	60 34.6	I. S.
	25	3 46.36	2.142	0 4 25.71	138.75	− 5 8 19.1	918.1	68.44	16 24.5	60 7.1	I. S.
	26	4 36.83	2.071	0 58 58.65	134.45	+ 1 0 1.0	914.2	67.38	16 14.2	59 29.4	I. S.
	27	5 26.14	2.046	1 52 22.00	132.94	+ 6 56 14.7	+ 859.2	67.02	16 2.4	58 46.3	I. S.
	28	6 15.35	2.061	2 45 39.45	133.87	12 21 40.9	761.4	67.27	15 50.3	58 1.9	I. S.
	29	7 5.30	2.104	3 39 40.97	136.45	17 0 34.7	627.4	67.92	15 38.6	57 19.0	I. S.
	30	7 56.43	2.156	4 34 53.64	139.57	20 39 30.2	462.7	68.67	15 27.8	56 39.2	I. S.
	31	8 48.68	2.194	5 31 14.01	141.87	23 7 40.4	275.2	69.18	15 18.1	56 3.7	I. N. S.
Feb.	1	9 41.47	2.198	6 28 6.62	142.10	+ 24 18 6.2	+ 76.3	69.16	15 9.6	55 32.5	I. N. S.
	2	10 33.83	2.158	7 24 33.07	139.66	24 9 4.6	− 119.7	68.48	15 2.3	55 5.7	I. N.
	3	11 24.71	2.078	8 19 31.04	134.85	22 44 41.8	298.4	67.21	14 56.1	54 43.0	I. N.
	4	12 13.36	1.975	9 12 14.62	128.66	20 14 0.5	449.9	65.58	14 51.1	54 24.5	I. II. N.
	5	12 59.47	1.869	10 2 25.28	122.30	16 48 59.8	569.7	63.90	14 47.3	54 10.5	II. N. S.
	6	13 43.19	1.778	10 50 12.03	116.81	+ 12 42 28.7	− 657.8	62.44	14 44.9	54 1.8	II. S.
	7	14 25.01	1.712	11 36 4.73	112.88	8 6 41.0	716.6	61.41	14 44.2	53 59.1	II. S.
	8	15 5.66	1.681	12 20 46.83	110.99	+ 3 12 39.2	749.4	60.94	14 45.4	54 3.7	II. S.
	9	15 45.99	1.687	13 5 10.30	111.38	− 1 49 36.1	757.9	61.13	14 48.9	54 16.5	II. S.
	10	16 26.98	1.735	13 50 12.54	114.25	6 50 29.6	742.3	61.99	14 54.9	54 38.4	II. S.
	11	17 9.62	1.826	14 36 54.90	119.73	− 11 39 51.6	− 699.6	63.55	15 3.5	55 10.1	II. S.
	12	17 54.97	1.959	15 26 19.69	127.75	16 5 46.1	623.7	65.73	15 14.9	55 51.7	II. S.
	13	18 43.96	2.127	16 19 23.52	137.86	19 53 20.9	506.4	68.36	15 28.6	56 42.3	II. S.
	14	19 37.20	2.309	17 16 43.37	148.80	22 44 14.6	339.2	71.08	15 44.4	57 40.0	II. S.
	15	20 34.64	2.470	18 18 15.66	158.45	− 24 17 47.2	− 120.4	73.38	16 1.0	58 40.9	II. N.

AT TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

Date.	Mean Time of Transit.	Diff. for 1 Hour of Long.	Right Ascension of Center.	Diff. for 1 Hour of Long.	Geocentric Declination of Center.	Diff. for 1 Hour of Long.	Sid. Time of Semid. Passing Meridian.	Geocentric Semi-diameter.	Equatorial Horizontal Parallax.	Bright Limbs.
	h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″	
Feb. 15	20 34.64	2.470	18 18 15.66	158.45	−24 17 47.2	−120.4	73.38	16 1.0	58 40.9	II. N.
16	21 35.24	2.566	19 22 58.21	164.25	24 15 7.9	+138.2	74.70	16 17.0	59 39.8	II. N.
17	22 37.09	2.573	20 28 56.12	164.63	22 25 48.4	407.0	74.73	16 30.8	60 30.3	II. N.
18	23 38.08	2.499	21 34 2.09	160.20	18 53 18.4	647.8	73.63	16 40.5	61 5.9	
20	0 36.72	2.384	22 36 46.35	153.28	13 55 34.0	829.1	71.96	16 44.8	61 21.8	
21	1 32.52	2.269	23 36 40.47	146.39	− 8 0 10.1	+934.9	70.29	16 43.2	61 15.8	I. S.
22	2 25.88	2.184	0 34 7.47	141.22	− 1 37 49.0	964.6	69.04	16 36.1	60 49.7	I. S.
23	3 17.65	2.138	1 29 58.53	138.46	+ 4 42 35.3	927.0	68.40	16 24.6	60 7.6	I. S.
24	4 8.79	2.130	2 25 11.52	137.99	10 36 25.9	833.8	68.35	16 10.4	59 15.7	I. S.
25	5 0.11	2.151	3 20 35.92	139.26	15 43 54.4	697.0	68.72	15 55.2	58 19.7	I. S.
26	5 52.12	2.184	4 16 41.60	141.22	+19 49 42.0	+527.3	69.24	15 40.2	57 24.5	I. S.
27	6 44.86	2.208	5 13 31.20	142.71	22 42 47.0	335.4	69.61	15 26.4	56 34.0	I. S.
28	7 37.89	2.205	6 10 38.32	142.54	24 16 39.5	+133.4	69.52	15 14.4	55 49.9	I. N. S.
Mar. 1	8 30.41	2.165	7 7 14.72	140.11	24 29 54.3	− 65.5	68.85	15 4.5	55 13.6	I. N.
2	9 21.52	2.090	8 2 26.38	135.57	23 26 16.8	249.2	67.60	14 56.6	54 44.8	I. N.
3	10 10.52	1.992	8 55 31.06	129.69	+21 13 53.8	−408.2	66.00	14 50.8	54 23.3	I. N.
4	10 57.09	1.889	9 46 9.30	123.54	18 3 39.6	537.9	64.32	14 46.7	54 8.5	I. N.
5	11 41.30	1.798	10 34 25.92	118.02	14 7 38.9	637.1	62.78	14 44.3	53 59.5	I. N.
6	12 23.57	1.728	11 20 45.29	113.85	9 37 52.9	706.9	61.62	14 43.4	53 56.2	II. N.
7	13 4.51	1.688	12 5 44.87	111.44	+ 4 45 47.6	749.0	60.97	14 44.0	53 58.4	II. N. S.
8	13 44.88	1.682	12 50 10.27	111.04	− 0 17 52.4	−765.0	60.90	14 46.1	54 6.3	II. S.
9	14 25.52	1.711	13 34 52.02	112.82	5 22 42.3	754.7	61.46	14 50.0	54 20.4	II. S.
10	15 7.32	1.779	14 20 43.70	116.88	10 18 4.0	717.2	62.66	14 55.7	54 41.3	II. S.
11	15 51.20	1.883	15 8 39.82	123.17	14 52 23.1	648.8	64.45	15 3.4	55 9.8	II. S.
12	16 37.98	2.020	15 59 31.36	131.41	18 52 20.3	544.4	66.70	15 13.4	55 46.2	II. S.
13	17 28.33	2.177	16 53 56.80	140.81	−22 2 22.7	−398.3	69.17	15 25.5	56 30.7	II. S.
14	18 22.43	2.328	17 52 8.10	149.93	24 5 4.3	−207.7	71.46	15 39.5	57 22.2	II. S.
15	19 19.79	2.443	18 53 35.68	156.82	24 43 13.2	+ 22.6	73.13	15 54.9	58 18.5	II. N.
16	20 19.17	2.493	19 57 4.80	159.87	23 43 53.2	275.8	73.81	16 10.5	59 15.8	II. N.
17	21 18.90	2.473	21 0 55.06	158.67	21 3 8.4	524.6	73.46	16 24.9	60 8.9	II. N.
18	22 17.50	2.404	22 3 37.22	154.50	−16 48 50.9	+738.8	72.38	16 36.6	60 51.6	II. N.
19	23 14.17	2.319	23 4 23.42	149.35	11 19 56.8	894.4	71.08	16 43.8	61 18.0	
21	0 8.91	2.247	0 3 13.41	145.05	− 5 2 58.9	977.7	70.00	16 45.3	61 23.7	
22	1 2.29	2.207	1 0 41.31	142.63	+ 1 32 9.5	985.5	69.40	16 40 9	61 7.6	
23	1 55.11	2.201	1 57 36.26	142.28	7 55 59.0	922.5	69.38	16 31.2	60 32.0	I. S.
24	2 48.17	2.223	2 54 44.59	143.62	+13 42 4.5	+798.9	69.76	16 17.6	59 41.8	I. S.
25	3 41.92	2.256	3 52 35.37	145.62	18 28 51.3	628.3	70.33	16 1.6	58 43.4	I. S.
26	4 36.41	2.280	4 51 9.90	147.03	22 0 38.5	426.8	70.74	15 45.2	57 43.1	I. S.
27	5 31.12	2.273	5 49 58.31	146.61	24 8 22.3	+211.0	70.68	15 29.6	56 45.8	I. S.
28	6 25.18	2.225	6 48 7.28	143.72	24 49 53.3	− 1.7	69.96	15 15.8	55 55.0	I. N.
29	7 17.61	2.139	7 44 38.18	138.54	+24 9 22.9	−197.0	68.62	15 4.3	55 13.0	I. N.
30	8 7.67	2.030	8 38 46.38	132.02	22 15 46.3	366.0	66.88	14 55.5	54 40.6	I. N.
31	8 55.03	1.918	9 30 12.81	125.25	19 20 34.9	504.7	65.02	14 49.3	54 17.9	I. N.
Apr. 1	9 39.83	1.818	10 19 4.35	119.24	15 36 1.7	613.1	63.31	14 45.5	54 4.1	I. N.
2	10 22.49	1.742	11 5 47.73	114.65	+11 13 56.1	−692.7	61.99	14 43.9	53 58.2	I. N.

AT TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

Date.	Mean Time of Transit.	Diff. for 1 Hour of Long.	Right Ascension of Center.	Diff. for 1 Hour of Long.	Geocentric Declination of Center.	Diff. for 1 Hour of Long.	Sid. Time of Semid. Passing Meridian.	Geocentric Semi-diameter.	Equatorial Horizontal Parallax.	Bright Limbs.
	h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″	
Apr. 2	10 22.49	1.742	11 5 47.73	114.65	+ 11 13 56.1	− 692.7	61.99	14 43.9	53 58.2	I. N.
3	11 3.67	1.696	11 51 2.04	111.86	6 25 24.2	745.5	61.17	14 44.3	53 59.4	I. N.
4	11 44.14	1.683	12 35 33.34	111.09	+ 1 21 0.6	772.1	60.93	14 46.3	54 6.8	I. N.
5	12 24.72	1.705	13 20 11.31	112.43	− 3 48 43.2	772.0	61.30	14 49.7	54 19.5	II. N. S.
6	13 6.26	1.763	14 5 47.20	115.93	8 52 47.7	743.3	62.30	14 54.5	54 37.0	II. N. S.
7	13 49.61	1.855	14 53 11.72	121.46	− 13 39 9.0	− 682.7	63.87	15 0.6	54 59.3	II. S.
8	14 35.53	1.976	15 43 11.13	128.74	17 54 13.5	586.1	65.89	15 8.0	55 26.4	II. S.
9	15 24.60	2.114	16 36 19.74	137.07	21 22 47.5	449.7	68.12	15 16.7	55 58.3	II. S.
10	16 17.00	2.249	17 32 48.69	145.18	23 48 31.6	272.2	70.26	15 26.8	56 35.6	II. S.
11	17 12.33	2.354	18 32 14.29	151.51	24 55 43.4	− 58.6	71.88	15 38.2	57 17.4	II. N.
12	18 9.58	2.406	19 33 35.21	154.62	− 24 32 18.3	+ 177.9	72.66	15 50.6	58 3.0	II. N.
13	19 7.34	2.398	20 35 27.19	154.14	22 33 8.9	416.3	72.53	16 3.5	58 50.3	II. N.
14	20 4.33	2.345	21 36 32.19	150.95	19 2 6.6	633.5	71.71	16 15.9	59 35.6	II. N.
15	20 59.78	2.275	22 36 4.82	146.74	14 11 48.6	809.7	70.60	16 26.5	60 14.7	II. N.
16	21 53.63	2.216	23 34 1.39	143.18	8 21 47.6	930.1	69.65	16 34.1	60 42.5	II. N.
17	22 46.39	2.186	0 30 52.17	141.40	− 1 56 22.2	+ 985.5	69.15	16 37.5	60 54.8	II. N.
18	23 38.87	2.193	1 27 26.13	141.80	+ 4 37 22.1	971.4	69.24	16 35.8	60 48.9	
20	0 31.93	2.233	2 24 34.71	144.18	10 51 31.0	888.2	69.84	16 29.1	60 24.3	
21	1 26.19	2.290	3 22 55.77	147.64	16 19 32.7	742.4	70.73	16 18.1	59 43.8	I. S.
22	2 21.80	2.341	4 22 38.62	150.72	20 38 51.8	547.3	71.56	16 4.0	58 52.1	I. S.
23	3 18.30	2.359	5 23 14.29	151.79	+ 23 33 28.1	+ 322.6	71.90	15 48.4	57 54.9	I. S.
24	4 14.62	2.324	6 23 38.92	149.69	24 56 2.2	+ 91.1	71.44	15 32.9	56 57.9	I. N.
25	5 9.44	2.237	7 22 34.12	144.43	24 48 19.9	− 125.7	70.18	15 18.6	56 5.5	I. N.
26	6 1.70	2.114	8 18 54.80	137.06	23 19 25.4	313.2	68.32	15 6.5	55 21.0	I. N.
27	6 50.85	1.981	9 12 8.20	129.07	20 42 22.6	466.1	66.22	14 57.0	54 46.2	I. N.
28	7 36.91	1.860	10 2 16.29	121.80	+ 17 11 8.4	− 584.7	64.24	14 50.4	54 22.0	I. N.
29	8 20.37	1.766	10 49 47.40	116.10	12 58 40.1	672.9	62.62	14 46.7	54 8.4	I. N.
30	9 1.95	1.705	11 35 25.30	112.42	8 16 23.6	734.2	61.53	14 45.7	54 4.6	I. N.
May 1	9 42.49	1.681	12 20 1.40	110.98	+ 3 14 34.1	770.8	61.06	14 47.0	54 9.6	I. N.
2	10 22.92	1.694	13 4 30.24	111.82	− 1 56 55.8	782.3	61.24	14 50.4	54 22.0	I. N.
3	11 4.15	1.747	13 49 47.24	114.98	− 7 7 42.1	− 766.6	62.09	14 55.5	54 40.5	I. N.
4	11 47.08	1.836	14 36 46.68	120.33	12 6 0.9	719.1	63.54	15 1.7	55 3.6	I. N.
5	12 32.54	1.956	15 26 18.00	127.55	16 38 7.8	634.7	65.49	15 9.0	55 30.2	II. N. S.
6	13 21.13	2.095	16 18 58.39	135.92	20 28 10.6	508.2	67.71	15 16.9	55 59.2	II. N. S.
7	14 13.09	2.232	17 15 0.90	144.15	23 18 50.2	338.0	69.86	15 25.3	56 30.0	II. S.
8	15 8.01	2.337	18 14 1.96	150.49	− 24 53 24.7	− 129.4	71.51	15 34.0	57 2.0	II. N. S.
9	16 4.84	2.387	19 14 57.50	153.48	24 59 6.8	+ 103.2	72.32	15 43.0	57 35.0	II. N.
10	17 2.08	2.373	20 16 17.94	152.61	23 30 29.4	338.4	72.15	15 52.1	58 8.4	II. N.
11	17 58.34	2.310	21 16 39.20	148.80	20 31 2.8	553.9	71.24	16 1.1	58 41.3	II. N.
12	18 52.79	2.227	22 15 11.50	143.84	16 12 15.5	732.8	69.99	16 9.4	59 12.0	II. N.
13	19 45.33	2.155	23 11 49.47	139.55	− 10 51 5.6	+ 864.6	68.86	16 16.6	59 38.4	II. N.
14	20 36.51	2.115	0 7 4.70	137.12	− 4 47 44.4	942.9	68.19	16 21.9	59 57.7	II. N.
15	21 27.20	2.116	1 1 51.05	137.19	+ 1 35 30.8	963.3	68.15	16 24.4	60 6.8	II. N.
16	22 18.43	2.159	1 57 9.76	139.76	7 54 43.4	922.2	68.76	16 23.4	60 3.2	II. N.
17	23 11.09	2.234	2 53 55.13	141.26	+ 13 44 53.8	+ 818.2	69.86	16 18.6	59 45.8	

AT TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

Date.	Mean Time of Transit.	Diff. for 1 Hour of Long.	Right Ascension of Center.	Diff. for 1 Hour of Long.	Geocentric Declination of Center.	Diff. for 1 Hour of Long.	Sid. Time of Semid. Passing Meridian.	Geocentric Semi-diameter.	Equatorial Horizontal Parallax.	Bright Limbs.
	h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″	
May 17	23 11.09	2.234	2 53 55.13	144.26	+ 13 44 53.8	+ 818.2	69.86	16 18.6	59 45.8	
19	0 5.73	2.318	3 52 38.76	149.32	18 41 21.2	654.9	71.13	16 10.4	59 15.4	
20	1 2.21	2.382	4 53 13.65	153.18	22 22 30.1	444.5	72.09	15 59.1	58 34.2	
21	1 59.65	2.394	5 54 45.84	153.85	24 33 27.1	+ 208.1	72.31	15 46.1	57 46.3	I. S.
22	2 56.55	2.337	6 55 45.81	150.46	25 9 5.8	− 27.6	71.54	15 32.4	56 55.9	I. N.
23	3 51.36	2.223	7 54 39.94	143.61	+ 24 14 35.5	− 239.4	69.89	15 19.2	56 7.8	I. N.
24	4 43.01	2.079	8 50 23.84	134.92	22 2 31.9	414.1	67.73	15 7.7	55 25.4	I. N.
25	5 31.16	1.936	9 42 37.08	126.31	18 48 35.7	549.1	65.50	14 58.4	54 51.5	I. N.
26	6 16.10	1.815	10 31 37.65	119.05	14 48 2.3	648.2	63.53	14 51.9	54 27.5	I. N.
27	6 58.54	1.729	11 18 7.93	113.87	10 14 1.8	717.2	62.09	14 48.4	54 14.6	I. N.
28	7 39.40	1.683	12 3 2.66	111.12	+ 5 17 34.6	− 761.0	61.28	14 47.8	54 12.4	I. N.
29	8 19.67	1.679	12 47 21.62	110.91	+ 0 8 18.8	781.4	61.16	14 50.0	54 20.5	I. N.
30	9 0.35	1.718	13 32 6.23	113.25	− 5 4 21.2	777.6	61.76	14 54.7	54 37.7	I. N.
31	9 42.49	1.799	14 18 17.79	118.11	10 10 1.3	745.5	63.06	15 1.4	55 2.4	I. N.
June 1	10 27.04	1.919	15 6 54.60	125.29	14 56 9.7	678.7	64.95	15 9.6	55 32.6	I. N.
2	11 14.81	2.066	15 58 45.57	134.16	− 19 7 23.6	− 569.7	67.25	15 18.8	56 6.2	I. N.
3	12 6.27	2.221	16 54 17.89	143.47	22 25 37.7	413.3	69.62	15 28.3	56 41.1	II. N. S.
4	13 1.22	2.351	17 53 20.51	151.31	24 31 50.1	− 210.8	71.60	15 37.6	57 15.1	II. N. S.
5	13 58.66	2.423	18 54 53.08	155.65	25 9 48.5	+ 24.7	72.71	15 46.1	57 46.5	II. N. S.
6	14 56.93	2.419	19 57 15.23	155.41	24 10 54.0	269.0	72.70	15 53.7	58 14.1	II. N.
7	15 54.26	2.349	20 58 40.77	151.21	− 21 37 2.2	+ 495.2	71.73	16 0.0	58 37.2	II. N.
8	16 49.43	2.247	21 57 57.02	145.02	17 39 57.7	682.5	70.23	16 5.1	58 56.1	II. N.
9	17 42.12	2.147	22 54 43.30	139.04	12 37 39.5	820.4	68.75	16 9.0	59 10.3	II. N.
10	18 32.73	2.077	23 49 24.98	134.83	6 50 39.1	906.0	67.68	16 11.5	59 19.6	II. N.
11	19 22.18	2.051	0 42 56.46	133.26	− 0 39 55.2	939.0	67.24	16 12.6	59 23.5	II. N.
12	20 11.57	2.072	1 36 24.65	134.56	+ 5 33 30.3	+ 919.2	67.53	16 11.9	59 21.1	II. N.
13	21 2.00	2.136	2 30 55.56	138.40	11 28 11.6	845.0	68.47	16 9.2	59 11.2	II. N.
14	21 54.34	2.228	3 27 20.99	143.89	16 42 12.8	715.9	69.81	16 4.4	58 53.4	II. N.
15	22 48.95	2.320	4 26 2.93	149.45	20 54 4.0	535.5	71.15	15 57.3	58 27.3	II. N.
16	23 45.44	2.379	5 26 38.43	152.99	23 45 21.2	315.9	72.00	15 48.2	57 54.0	
18	0 42.64	2.375	6 27 56.10	152.74	+ 25 4 31.5	+ 79.2	71.95	15 37.7	57 15.6	
19	1 38.87	2.300	7 28 15.68	148.21	24 49 56.2	− 148.4	70.87	15 26.6	56 34.7	I. N.
20	2 32.60	2.171	8 26 4.90	140.50	23 9 47.1	345.9	68.99	15 15.6	55 54.5	I. N.
21	3 22.94	2.023	9 20 30.11	131.54	20 18 44.4	502.3	66.74	15 5.7	55 18.2	I. N.
22	4 9.77	1.883	10 11 24.08	123.16	16 33 27.6	617.6	64.56	14 57.6	54 48.5	I. N.
23	4 53.56	1.772	10 59 15.44	116.49	+ 12 9 22.6	− 697.3	62.79	14 51.9	54 27.3	I. N.
24	5 35.14	1.700	11 44 53.76	112.14	7 19 25.3	748.0	61.60	14 48.8	54 16.0	I. N.
25	6 15.50	1.671	12 29 18.43	110.37	+ 2 14 12.5	774.2	61.11	14 48.6	54 15.5	I. N.
26	6 55.69	1.686	13 13 32.95	111.31	− 2 56 57.2	777.8	61.35	14 51.5	54 26.0	I. N.
27	7 36.79	1.747	13 58 42.46	114.95	8 4 49.2	757.1	62.34	14 57.2	54 47.0	I. N.
28	8 19.89	1.852	14 45 52.03	121.27	− 12 58 47.9	− 707.2	64.03	15 5.4	55 17.0	I. N.
29	9 6.00	1.996	15 36 2.43	129.93	17 25 39.1	620.1	66.29	15 15.6	55 54.4	I. N.
30	9 55.89	2.164	16 30 0.59	140.04	21 8 43.1	487.0	68.85	15 27.1	56 36.5	I. N.
July 1	10 49.83	2.328	17 28 2.54	149.89	23 48 23.8	302.9	71.26	15 38.9	57 20.1	I. N. S.
2	11 47.25	2.447	18 29 34.00	157.08	− 25 4 57.6	− 73.6	73.00	15 50.2	58 1.6	I. N. S.

AT TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

Date.	Mean Time of Transit	Diff. for 1 Hour of Long.	Right Ascension of Center.	Diff. for 1 Hour of Long.	Geocentric Declination of Center.	Diff. for 1 Hour of Long.	Sid. Time of Semid. Passing Meridian.	Geocentric Semi-diameter.	Equatorial Horizontal Parallax.	Bright Limbs.
	h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″	
July 2	11 47.25	2.447	18 29 34.00	157.08	−25 4 57.6	− 73.6	73.00	15 50.2	58 1.6	I. N. S.
3	12 46.65	2.487	19 33 3.99	159.51	24 43 50.8	+ 180.8	73.59	16 0.1	58 37.9	II. N. S.
4	13 45.97	2.443	20 36 29.38	156.81	22 41 11.4	428.7	72.98	16 7.8	59 6.0	II. N. S.
5	14 43.42	2.339	21 38 2.58	150.57	19 5 47.7	640.3	71.51	16 12.9	59 24.6	II. N.
6	15 38.10	2.218	22 36 48.67	143.31	14 16 15.5	797.5	69.75	16 15.2	59 33.1	II. N.
7	16 30.05	2.117	23 32 51.02	137.21	− 8 35 42.3	+ 895.3	68.25	16 15.1	59 32.8	II. N.
8	17 20.02	2.055	0 26 54.28	133.52	− 2 27 40.1	935.6	67.33	16 13.0	59 25.0	II. N.
9	18 9.11	2.043	1 20 3.80	132.75	+ 3 45 43.6	922.7	67.14	16 9.2	59 11.0	II. N.
10	18 58.46	2.077	2 13 29.42	134.81	9 43 49.7	859.5	67.66	16 4.1	58 52.5	II. N.
11	19 49.10	2.148	3 8 12.82	139.11	15 6 52.5	747.7	68.72	15 58.1	58 30.4	II. N.
12	20 41.70	2.236	4 4 54.44	144.41	+ 19 35 45.6	+ 589.4	70.01	15 51.2	58 4.9	II. N.
13	21 36.36	2.313	5 3 39.05	149.01	22 52 59.0	391.0	71.10	15 43.4	57 36.5	II. N.
14	22 32.37	2.345	6 3 45.71	150.95	24 45 7.3	+ 167.0	71.51	15 35.0	57 5.7	II. S.
15	23 28.41	2.313	7 3 53.54	149.00	25 6 0.3	− 61.3	71.01	15 26.2	56 33.2	
17	0 22.89	2.219	8 2 28.08	143.34	23 58 35.3	271.1	69.59	15 17.2	56 0.3	
18	1 14.59	2.086	8 58 15.29	135.37	+ 21 33 49.9	− 446.0	67.57	15 8.5	55 28.4	I. N.
19	2 2.96	1.946	9 50 41.96	126.92	18 7 14.6	579.9	65.40	15 0.6	54 59.5	I. N.
20	2 48.12	1.822	10 39 55.44	119.46	13 55 7.3	674.5	63.45	14 54.2	54 35.9	I. N.
21	3 30.66	1.730	11 26 31.47	113.91	9 12 10.7	735.1	61.98	14 49.6	54 19.1	I. N.
22	4 11.44	1.676	12 11 21.74	110.71	+ 4 10 46.4	767.7	61.14	14 47.4	54 10.8	I. N.
23	4 51.45	1.665	12 55 25.44	110.06	− 0 58 44.9	− 776.1	61.00	14 47.7	54 12.0	I. N.
24	5 31.74	1.699	13 39 45.48	112.09	6 7 5.9	761.7	61.60	14 51.0	54 24.1	I. N.
25	6 13.36	1.778	14 25 26.59	116.81	11 4 47.8	722.2	62.93	14 57.2	54 46.9	I. N.
26	6 57.41	1.900	15 13 33.20	124.16	15 40 48.8	652.1	64.91	15 6.2	55 20.0	I. N.
27	7 44.85	2.058	16 5 3.82	133.68	19 41 19.8	543.2	67.40	15 17.7	56 2.3	I. N.
28	8 36.35	2.234	17 0 38.79	144.27	− 22 49 3.8	− 386.9	70.04	15 31.1	56 51.3	I. N.
29	9 31.95	2.394	18 0 20.81	153.86	24 44 12.4	− 180.6	72.36	15 45.4	57 43.7	I. N. S.
30	10 30.78	2.496	19 3 16.63	160.01	25 8 1.6	+ 66.6	73.79	15 59.4	58 35.2	I. S.
31	11 31.05	2.512	20 7 39.26	160.96	23 48 49.6	329.1	73.99	16 11.8	59 20.8	I. S.
Aug. 1	12 30.68	2.446	21 11 23.24	157.02	20 47 19.4	572.3	73.04	16 21.4	59 55.8	II. S.
2	13 28.09	2.335	22 12 54.25	150.32	− 16 17 31.8	+ 766.6	71.42	16 27.0	60 16.5	II. N. S.
3	14 22.72	2.220	23 11 37.34	143.43	10 42 45.3	895.8	69.75	16 28.5	60 22.1	II. N.
4	15 14.88	2.133	0 7 52.07	138.20	− 4 29 57.7	957.0	68.48	16 26.1	60 13.2	II. N.
5	16 5.46	2.090	1 2 31.58	135.58	+ 1 54 28.1	955.1	67.86	16 20.4	59 52.1	II. N.
6	16 55.55	2.093	1 56 41.87	135.75	8 6 37.4	896.8	67.94	16 12.2	59 22.3	II. N.
7	17 46.21	2.135	2 51 26.13	138.29	+ 13 45 18.0	+ 788.7	68.62	16 2.8	58 47.5	II. N.
8	18 38.21	2.201	3 47 31.63	142.31	18 31 42.0	636.4	69.63	15 52.7	58 10.5	II. N.
9	19 31.88	2.268	4 45 16.95	146.33	22 9 29.5	447.1	70.61	15 42.6	57 33.4	II. N.
10	20 26.87	2.307	5 44 21.76	148.64	24 25 57.8	232.1	71.13	15 32.8	56 57.6	II. N.
11	21 22.19	2.294	6 43 47.06	147.88	25 14 5.6	+ 8.6	70.87	15 23.6	56 23.8	II. S.
12	22 16.52	2.224	7 42 12.34	143.69	+ 24 34 17.4	− 204.2	69.77	15 15.1	55 52.5	II. S.
13	23 8.63	2.112	8 38 23.59	136.93	22 34 24.2	389.6	67.99	15 7.2	55 23.7	
14	23 57.77	1.982	9 31 36.61	129.09	19 27 34.6	538.1	65.93	15 0.2	54 58.0	
16	0 43.82	1.859	10 21 43.84	121.67	15 29 10.3	647.6	63.95	14 54.2	54 36.0	
17	1 27.15	1.758	11 9 7.66	115.62	+ 10 54 17.4	− 721.1	62.33	14 49.5	54 18.5	I. N.

AT TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

Date.	Mean Time of Transit.	Diff. for 1 Hour of Long.	Right Ascension of Center.	Diff. for 1 Hour of Long.	Geocentric Declination of Center.	Diff. for 1 Hour of Long.	Sid. Time of Semid. Passing Meridian.	Geocentric Semi-diameter.	Equatorial Horizontal Parallax.	Bright Limbs.
	h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″	
Aug. 17	1 27.15	1.758	11 9 7.66	115.62	+ 10 54 17.4	− 721.1	62.33	14 49.5	54 18.5	I. N.
18	2 8.46	1.690	11 54 29.42	111.56	5 56 25.3	763.3	61.24	14 46.2	54 6.7	I. N.
19	2 48.59	1.660	12 38 40.58	109.76	+ 0 47 13.6	778.4	60.81	14 45.0	54 2.0	I. N.
20	3 28.49	1.671	13 22 37.58	110.39	− 4 23 2.5	768.9	61.05	14 45.9	54 5.3	I. N.
21	4 9.14	1.723	14 7 19.53	113.52	9 24 42.8	735.2	61.99	14 49.3	54 17.9	I. N.
22	4 51.53	1.817	14 53 46.65	119.16	− 14 7 37.4	− 674.5	63.60	14 55.5	54 40.8	I. N.
23	5 36.64	1.948	15 42 57.11	127.07	18 20 0.5	581.4	65.77	15 4.5	55 13.8	I. N.
24	6 25.27	2.108	16 35 39.56	136.65	21 47 33.3	449.1	68.28	15 16.3	55 56.9	I. N.
25	7 17.85	2.273	17 32 19.71	146.59	24 13 12.7	271.4	70.79	15 30.4	56 48.6	I. N. S.
26	8 14.14	2.410	18 32 42.63	154.84	25 18 41.9	− 49.2	72.76	15 46.0	57 45.9	I. S.
27	9 13.02	2.484	19 35 41.92	159.32	− 24 48 25.3	+ 203.9	73.78	16 2.1	58 45.0	I. S.
28	10 12.76	2.480	20 39 32.37	159.09	22 34 52.3	461.8	73.67	16 17.1	59 40.1	I. S.
29	11 11.58	2.413	21 42 28.00	155.05	18 42 43.0	691.7	72.64	16 29.4	60 25.4	I. S.
30	12 8.38	2.318	22 43 21.75	149.33	13 28 50.5	866.8	71.23	16 37.6	60 55.3	I. II. S.
31	13 2.93	2.231	23 42 0.57	144.12	7 18 40.0	971.6	69.94	16 40.5	61 6.1	II. N. S.
Sept. 1	13 55.76	2.177	0 38 55.13	140.82	− 0 41 22.4	+ 1002.5	69.14	16 38.1	60 57.1	II. N.
2	14 47.75	2.163	1 34 59.67	139.98	+ 5 54 3.3	963.5	69.00	16 30.9	60 30.6	II. N.
3	15 39.88	2.187	2 31 12.72	141.44	12 1 11.4	862.7	69.43	16 20.1	59 51.1	II. N.
4	16 32.93	2.237	3 28 21.28	144.43	17 17 16.9	710.0	70.24	16 7.2	59 3.7	II. N.
5	17 27.27	2.290	4 26 47.05	147.62	21 23 52.3	517.2	71.07	15 53.4	58 13.3	II. N.
6	18 22.66	2.320	5 26 15.85	149.41	+ 24 7 36.7	+ 298.4	71.52	15 40.0	57 23.9	II. N.
7	19 18.25	2.304	6 25 57.21	148.50	25 21 29.1	+ 71.0	71.26	15 27.6	56 38.4	II. S.
8	20 12.85	2.237	7 24 38.77	144.45	25 5 46.3	− 146.5	70.19	15 16.6	55 58.2	II. S.
9	21 5.31	2.130	8 21 11.64	137.97	23 27 39.4	338.8	68.46	15 7.3	55 24.0	II. S.
10	21 54.91	2.002	9 14 52.09	130.33	20 39 16.0	497.0	66.41	14 59.6	54 55.6	II. S.
11	22 41.47	1.879	10 5 29.66	122.93	+ 16 55 1.7	− 618.0	64.38	14 53.4	54 33.0	II. S.
12	23 25.28	1.776	10 53 22.28	116.72	12 29 30.1	703.9	62.65	14 48.7	54 15.7	
14	0 6.96	1.702	11 39 6.52	112.29	7 36 12.1	757.5	61.41	14 45.4	54 3.7	
15	0 47.28	1.663	12 23 29.04	109.94	+ 2 27 17.2	782.4	60.77	14 43.7	53 57.2	
16	1 27.10	1.661	13 7 21.28	109.78	− 2 46 13.4	780.7	60.76	14 43.5	53 56.4	I. N.
17	2 7.31	1.696	13 51 36.69	111.87	− 7 53 54.8	− 753.3	61.41	14 45.0	54 2.2	I. N.
18	2 48.79	1.768	14 37 9.31	116.20	12 45 17.1	698.8	62.70	14 48.6	54 15.4	I. N.
19	3 32.43	1.874	15 24 51.32	122.62	17 9 0.6	614.4	64.53	14 54.5	54 36.8	I. N.
20	4 18.98	2.008	16 15 28.33	130.68	20 52 15.0	495.6	66.75	15 2.8	55 7.4	I. N.
21	5 8.93	2.155	17 9 30.15	139.49	23 40 18.9	338.1	69.08	15 13.6	55 47.2	I. N.
22	6 2.31	2.289	18 6 58.20	147.59	− 25 17 22.4	− 140.9	71.14	15 26.9	56 35.8	I. S.
23	6 58.49	2.383	19 7 14.73	153.25	25 28 33.7	+ 89.5	72.53	15 42.1	57 31.5	I. S.
24	7 56.23	2.418	20 9 5.54	155.33	24 3 35.5	336.4	72.99	15 58.4	58 31.4	I. S.
25	8 54.08	2.394	21 11 2.12	153.87	21 0 27.8	575.8	72.57	16 14.5	59 30.7	I. S.
26	9 50.85	2.334	22 11 54.26	150.26	16 27 23.1	782.0	71.62	16 29.0	60 23.6	I. S.
27	10 46.05	2.268	23 11 12.29	146.34	− 10 42 6.6	+ 933.8	70.59	16 39.8	61 3.4	I. S.
28	11 39.91	2.224	0 9 9.01	143.70	− 4 9 34.5	1016.5	69.90	16 45.6	61 24.8	I. S.
29	12 33.12	2.216	1 6 26.67	143.16	+ 2 41 3.4	1023.7	69.78	16 45.6	61 24.5	II. N. S.
30	13 26.57	2.245	2 3 59.24	144.90	9 19 18.9	955.3	70.26	16 39.6	61 2.8	II. N.
Oct. 1	14 21.06	2.300	3 2 34.37	148.21	+ 15 16 9.6	+ 818.3	71.14	16 28.8	60 22.9	II. N.

AT TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

Date.	Mean Time of Transit.	Diff. for 1 Hour of Long.	Right Ascension of Center.	Diff. for 1 Hour of Long.	Geocentric Declination of Center.	Diff. for 1 Hour of Long.	Sid. Time of Semid. Passing Meridian.	Geocentric Semi-diameter.	Equatorial Horizontal Parallax.	Bright Limbs.
	h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″	
Oct. 1	14 21.06	2.300	3 2 34.37	148.21	+15 16 9.6	+ 818.3	71.14	16 28.8	60 22.9	II. N.
2	15 16.99	2.360	4 2 35.79	151.82	20 6 31.7	625.6	72.11	16 14.6	59 30.8	II. N.
3	16 14.12	2.394	5 3 49.42	153.91	23 31 43.1	395.9	72.69	15 58.7	58 32.5	II. N.
4	17 11.53	2.379	6 5 19.82	153.01	25 21 28.4	+ 152.5	72.50	15 42.7	57 34.0	II. S.
5	18 7.86	2.306	7 5 45.67	148.58	25 35 0.6	− 81.4	71.41	15 27.9	56 39.5	II. S.
6	19 1.82	2.185	8 3 48.80	141.33	+24 20 0.3	− 287.9	69.57	15 14.9	55 51.9	II. S.
7	19 52.60	2.044	8 58 40.35	132.87	21 49 40.8	457.2	67.34	15 4.2	55 12.7	II. S.
8	20 40.01	1.909	9 50 9.33	124.69	18 19 21.1	588.1	65.10	14 55.9	54 42.1	II. S.
9	21 24.39	1.795	10 38 36.14	117.84	14 3 55.8	683.3	63.16	14 49.8	54 19.7	II. S.
10	22 6.41	1.712	11 24 40.54	112.88	9 16 51.5	747.0	61.71	14 45.8	54 5.1	II. S.
11	22 46.88	1.666	12 9 11.69	110.09	+ 4 10 4.5	− 782.3	60.88	14 43.7	53 57.3	
12	23 26.66	1.656	12 53 2.08	109.50	− 1 5 29.5	791.1	60.68	14 43.2	53 55.5	
14	0 6.66	1.683	13 37 4.96	111.11	6 19 17.1	773.4	61.14	14 44.3	53 59.4	
15	0 47.73	1.745	14 22 12.43	114.85	11 20 27.0	727.6	62.22	14 46.8	54 8.8	I. N.
16	1 30.69	1.840	15 9 13.58	120.54	15 57 16.5	651.0	63.84	14 50.8	54 23.6	I. N.
17	2 16.23	1.959	15 58 50.16	127.70	−19 56 48.0	− 540.5	65.84	14 56.5	54 44.5	I. N.
18	3 4.80	2.089	16 51 29.09	135.55	23 4 48.6	393.2	67.98	15 4.0	55 11.9	I. N.
19	3 56.44	2.210	17 47 12.32	142.83	25 6 34.1	− 209.8	69.92	15 13.4	55 46.3	I. N.
20	4 50.62	2.298	18 45 28.68	148.09	25 48 33.2	+ 3.9	71.30	15 24.7	56 27.8	I. S.
21	5 46.31	2.334	19 45 15.90	150.29	25 1 5.4	234.8	71.87	15 37.7	57 15.6	I. S.
22	6 42.26	2.320	20 45 18.19	149.43	−22 40 53.2	+ 464.4	71.64	15 52.0	58 8.2	I. S.
23	7 37.41	2.272	21 44 32.86	146.58	18 52 17.5	673.6	70.90	16 6.9	59 2.6	I. S.
24	8 31.28	2.218	22 42 30.78	143.32	13 46 59.0	845.4	70.02	16 20.9	59 54.2	I. S.
25	9 24.04	2.182	23 39 21.31	141.17	7 42 46.0	966.0	69.41	16 32.8	60 37.7	I. S.
26	10 16.33	2.182	0 35 44.28	141.14	− 1 2 32.0	1023.7	69.35	16 40.8	61 7.0	I. S.
27	11 9.11	2.223	1 32 36.16	143.61	+ 5 46 40.7	+1009.7	69.94	16 43.7	61 17.6	I. S.
28	12 3.32	2.300	2 30 54.15	148.20	12 15 3.4	919.4	71.09	16 40.8	61 7.2	II. N. S.
29	12 59.61	2.392	3 31 17.36	153.75	17 52 23.1	755.8	72.50	16 32.5	60 36.6	II. N.
30	13 57.99	2.466	4 33 45.96	158.25	22 11 43.9	532.8	73.65	16 19.8	59 49.8	II. N.
31	14 57.57	2.486	5 37 27.17	159.46	24 53 59.9	275.4	74.01	16 4.2	58 52.7	II. N.
Nov. 1	15 56.73	2.430	6 40 43.06	156.06	+25 51 46.6	+ 15.7	73.26	15 47.6	57 52.0	II. N. S.
2	16 53.67	2.306	7 41 45.46	148.58	25 10 2.8	− 218.2	71.46	15 31.6	56 53.2	II. S.
3	17 47.10	2.144	8 39 16.85	138 86	23 2 52.7	409.9	69.02	15 17.3	56 0.5	II. S.
4	18 36.58	1.981	9 32 50.00	129.03	19 48 9.8	556.3	66.45	15 5.3	55 16.6	II. S.
5	19 22.37	1.841	10 22 41.82	120.60	15 43 19.5	661.7	64.14	14 56.0	54 42.6	II. S.
6	20 5.22	1.736	11 9 36.27	114.34	+11 3 19.4	− 733.1	62.34	14 49.6	54 18.9	II. S.
7	20 46.05	1.673	11 54 29.40	110.52	6 0 33.3	776.3	61.20	14 45.7	54 4.8	II. S.
8	21 25.86	1.651	12 38 20.82	109.18	+ 0 45 38.7	794.1	60.75	14 44.4	53 59.8	II. S.
9	22 5.62	1.669	13 22 9.61	110.28	− 4 31 28.0	787.1	61.00	14 45.1	54 2.5	II. S.
10	22 46.28	1.726	14 6 52.81	113.69	9 40 30.5	753.3	61.92	14 47.6	54 11.6	
11	23 28.74	1.818	14 53 23.60	119.20	−14 30 1.8	− 688.8	63.43	14 51.6	54 26.3	
13	0 13.74	1.936	15 42 27.30	126.33	18 46 51.4	589.1	65.36	14 56.8	54 45.4	
14	1 1.77	2.067	16 34 33.64	134.23	22 16 8.9	450.7	67.48	15 3.0	55 8.3	I. N.
15	1 52.89	2.189	17 29 46.07	141.57	24 42 17.6	273.9	69.43	15 10.3	55 35.0	I. N.
16	2 46.57	2.276	18 27 32.29	146.79	−25 51 0.6	− 65.3	70.82	15 18.5	56 5.1	I. N.

AT TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

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	h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″	
Nov. 16	2 46.57	2.276	18 27 32.29	146.79	− 25 51 0.6	− 65.3	70.82	15 18.5	56 5.1	I. N.
17	3 41.71	2.308	19 26 45.92	148.73	25 32 17.3	+ 160.4	71.38	15 27.7	56 38.9	I. S.
18	4 36.93	2.285	20 26 4.81	147.33	23 42 55.2	384.5	71.08	15 37.9	57 16.1	I. S.
19	5 31.09	2.224	21 24 19.91	143.69	20 27 16.4	589.1	70.20	15 48.8	57 56.2	I. S.
20	6 23.63	2.155	22 20 57.56	139.51	15 56 3.2	760.6	69.14	16 0.1	58 37.7	I. S.
21	7 14.67	2.104	23 16 5.12	136.41	− 10 24 20.2	+ 890.3	68.32	16 11.1	59 18.2	I. S.
22	8 4.89	2.088	0 10 23.04	135.52	− 4 10 15.3	971.3	68.04	16 21.0	59 54.3	I. S.
23	8 55.30	2.120	1 4 52.56	137.43	+ 2 25 14.3	996.0	68.47	16 28.4	60 21.7	I. S.
24	9 47.05	2.199	2 0 42.41	142.17	8 58 0.1	956.2	69.62	16 32.4	60 36.3	I. S.
25	10 41.15	2.314	2 58 53.94	149.04	15 0 44.7	845.2	71.31	16 32.0	60 34.9	I. S.
26	11 38.16	2.436	4 0 0.54	156.39	+ 20 4 36.9	+ 662.8	73.09	16 26.9	60 16.1	I. N. S.
27	12 37.77	2.522	5 3 43.67	161.61	23 43 8.9	422.0	74.37	16 17.4	59 41.2	II. N. S.
28	13 38.60	2.531	6 8 39.96	162.14	25 38 13.4	+ 151.4	74.55	16 4.6	58 54.2	II. N. S.
29	14 38.51	2.446	7 12 40.61	157.02	25 45 15.5	− 112.1	73.37	15 49.8	58 0.0	II. N. S.
30	15 35.44	2.290	8 13 42.53	147.64	24 13 37.8	338.0	71.13	15 34.6	57 4.2	II. S.
Dec. 1	16 28.21	2.106	9 10 33.88	136.59	+ 21 21 44.2	− 512.6	68.39	15 20.4	56 11.9	II. S.
2	17 16.65	1.934	10 3 4.90	126.25	17 30 17.3	636.9	65.70	15 8.0	55 26.6	II. S.
3	18 1.35	1.797	10 51 50.65	117.98	12 57 48.8	719.3	63.46	14 58.2	54 50.6	II. S.
4	18 43.26	1.704	11 37 49.05	112.35	7 59 10.1	769.1	61.87	14 51.3	54 25.3	II. S.
5	19 23.49	1.656	12 22 5.92	109.52	+ 2 46 2.7	792.5	61.03	14 47.4	54 11.0	II. S.
6	20 3.14	1.655	13 5 47.75	109.43	− 2 31 47.1	− 792.7	60.95	14 46.4	54 7.3	II. S.
7	20 43.28	1.697	13 49 59.29	111.98	7 45 1.2	769.2	61.61	14 48.1	54 13.5	II. S.
8	21 24.94	1.781	14 35 42.16	117.00	12 43 31.9	718.3	62.94	14 52.0	54 27.8	II. S.
9	22 9.04	1.899	15 23 51.87	124.12	17 15 15.9	634.3	64.83	14 57.7	54 48.9	II. S.
10	22 56.28	2.040	16 15 10.93	132.60	21 5 43.9	511.0	67.04	15 4.8	55 14.9	
11	23 46.96	2.181	17 9 56.81	141.08	− 23 58 24.1	− 345.2	69.21	15 12.8	55 44.0	
13	0 40.73	2.292	18 7 48.08	147.73	25 36 41.5	− 140.6	70.89	15 21.1	56 14.5	
14	1 36.48	2.343	19 7 38.83	150.81	25 47 31.8	+ 88.9	71.70	15 29.4	56 45.1	I. N.
15	2 32.63	2.325	20 7 53.62	149.75	24 25 12.1	321.2	71.50	15 37.5	57 14.9	I. S.
16	3 27.66	2.254	21 7 0.95	145.46	21 33 15.2	533.6	70.52	15 45.4	57 43.6	I. S.
17	4 20.65	2.161	22 4 5.48	139.87	− 17 23 13.4	+ 709.6	69.15	15 52.8	58 10.8	I. S.
18	5 11.47	2.079	22 59 0.04	134.92	12 11 28.7	841.4	67.91	15 59.7	58 36.4	I. S.
19	6 0.70	2.031	23 52 18.16	132.03	− 6 16 25.0	926.0	67.17	16 6.1	58 59.7	I. S.
20	6 49.31	2.030	0 44 59.69	131.96	+ 0 2 46.1	961.6	67.14	16 11.5	59 19.6	I. S.
21	7 38.53	2.080	1 38 17.04	135.01	6 25 53.9	944.9	67.90	16 15.5	59 34.3	I. S.
22	8 29.55	2.178	2 33 23.24	140.92	+ 12 30 58.5	+ 870.3	69.37	16 17.5	59 41.6	I. S.
23	9 23.35	2.308	3 31 16.98	148.71	17 53 43.5	732.7	71.27	16 16.9	59 39.4	I. S.
24	10 20.33	2.436	4 32 21.28	156.39	22 8 45.0	532.7	73.09	16 13.2	59 26.0	I. S.
25	11 19.87	2.514	5 36 0.41	161.14	24 53 19.0	284.0	74.21	16 6.4	59 1.0	I. N. S.
26	12 20.31	2.505	6 40 33.20	160.59	25 53 18.9	+ 15.7	74.07	15 56.8	58 25.8	II. N. S.
27	13 19.37	2.402	7 43 43.20	154.39	+ 25 8 5.1	− 236.3	72.59	15 45.2	57 43.1	II. N. S.
28	14 15.12	2.237	8 43 33.83	144.43	22 50 9.2	444.6	70.17	15 32.6	56 57.0	II. S.
29	15 6.60	2.054	9 39 7.73	133.43	19 19 42.8	598.6	67.43	15 20.2	56 11.4	II. S.
30	15 53.88	1.891	10 30 28.51	123.61	14 58 6.5	701.8	64.88	15 8.9	55 29.9	II. S.
31	16 37.67	1.766	11 18 19.67	116.10	+ 10 3 51.2	− 763.5	62.88	14 59.6	54 55.7	II. S.

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi-diam.	Sid.T. of S.D. Pass. Mer.	Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi-diam.	Sid.T. of S.D. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
Jan. 0	0 23.3	19 2 13.71	−24 42 11.0	6.2	2.4	0.17	Feb. 14	23 35.7	21 15 50.76	−12 8 22.9	13.6	5.2	0.34
1	0 26.5	19 9 22.71	24 33 16.8	6.2	2.4	0.17	15	23 28.2	21 12 17.09	12 31 33.5	13.5	5.1	0.34
2	0 29.7	19 16 31.83	24 22 49.1	6.2	2.4	0.17	16	23 21.1	21 9 8.83	12 54 14.2	13.4	5.1	0.34
3	0 32.9	19 23 40.76	24 10 47.6	6.3	2.4	0.17	17	23 14.5	21 6 28.39	13 16 3.7	13.3	5.0	0.33
4	0 36.1	19 30 49.29	23 57 11.5	6.3	2.4	0.17	18	23 8.4	21 4 17.24	13 36 45.0	13.1	5.0	0.33
5	0 39.2	19 37 57.17	−23 42 0.7	6.4	2.4	0.17	19	23 2.8	21 2 36.07	−13 56 5.0	12.9	4.9	0.33
6	0 42.4	19 45 4.12	23 25 14.9	6.5	2.4	0.17	20	22 57.7	21 1 24.91	14 13 54.0	12.7	4.9	0.33
7	0 45.6	19 52 9.81	23 6 53.9	6.5	2.4	0.17	21	22 53.0	21 0 43.24	14 30 5.1	12.5	4.8	0.32
8	0 48.7	19 59 13.89	22 46 58.2	6.6	2.5	0.17	22	22 48.9	21 0 30.13	14 44 33.5	12.3	4.7	0.32
9	0 51.8	20 6 15.96	22 25 28.1	6.6	2.5	0.18	23	22 45.2	21 0 44.38	14 57 16.6	12.0	4.6	0.31
10	0 54.8	20 13 15.57	−22 2 24.5	6.7	2.6	0.18	24	22 42.0	21 1 24.63	−15 8 12.9	11.7	4.5	0.31
11	0 57.8	20 20 12.22	21 37 48.7	6.8	2.6	0.18	25	22 39.1	21 2 29.38	15 17 21.9	11.5	4.4	0.31
12	1 0.7	20 27 5.36	21 11 42.4	6.9	2.6	0.18	26	22 36.6	21 3 57.08	15 24 43.7	11.3	4.3	0.30
13	1 3.6	20 33 54.35	20 44 7.8	6.9	2.6	0.19	27	22 34.5	21 5 46.19	15 30 19.2	11.1	4.2	0.30
14	1 6.4	20 40 38.46	20 15 7.7	7.0	2.6	0.19	28	22 32.7	21 7 55.19	15 34 9.6	10.9	4.1	0.29
15	1 9.1	20 47 16.87	−19 44 45.8	7.1	2.7	0.19	Mar. 1	22 31.2	21 10 22.63	−15 36 16.3	10.6	4.0	0.28
16	1 11.6	20 53 48.64	19 13 6.8	7.2	2.7	0.19	2	22 30.0	21 13 7.12	15 36 40.7	10.4	4.0	0.28
17	1 14.1	21 0 12.71	18 40 16.3	7.3	2.7	0.19	3	22 29.1	21 16 7.36	15 35 24.4	10.2	3.9	0.27
18	1 16.4	21 6 27.88	18 6 21.0	7.4	2.8	0.20	4	22 28.4	21 19 22.12	15 32 29.0	10.0	3.9	0.27
19	1 18.5	21 12 32.78	17 31 29.2	7.5	2.8	0.20	5	22 27.9	21 22 50.27	15 27 56.1	9.8	3.8	0.26
20	1 20.5	21 18 25.87	−16 55 50.3	7.7	2.9	0.20	6	22 27.7	21 26 30.77	−15 21 47.3	9.7	3.7	0.25
21	1 22.2	21 24 5.44	16 19 35.7	7.9	3.0	0.21	7	22 27.6	21 30 22.65	15 14 4.1	9.5	3.7	0.24
22	1 23.6	21 29 29.56	15 42 58.8	8.1	3.1	0.21	8	22 27.7	21 34 25.01	15 4 48.0	9.3	3.6	0.24
23	1 24.8	21 34 36.08	15 6 14.7	8.3	3.1	0.22	9	22 27.9	21 38 37.04	14 54 0.5	9.2	3.6	0.23
24	1 25.6	21 39 22.71	14 29 40.7	8.5	3.2	0.22	10	22 28.3	21 42 58.02	14 41 43.0	9.1	3.5	0.23
25	1 26.1	21 43 46.97	−13 53 36.1	8.7	3.3	0.23	11	22 28.9	21 47 27.27	−14 27 56.6	9.0	3.4	0.22
26	1 26.2	21 47 46.19	13 18 22.5	9.0	3.4	0.24	12	22 29.6	21 52 4.14	14 12 42.8	8.8	3.4	0.22
27	1 25.7	21 51 17.61	12 44 23.5	9.2	3.5	0.25	13	22 30.4	21 56 48.11	13 56 2.9	8.7	3.3	0.22
28	1 24.8	21 54 18.46	12 12 3.7	9.5	3.6	0.25	14	22 31.3	22 1 38.70	13 37 58.0	8.6	3.3	0.21
29	1 23.3	21 56 45.99	11 41 49.3	9.8	3.7	0.26	15	22 32.3	22 6 35.45	13 18 29.2	8.5	3.2	0.21
30	1 21.2	21 58 37.66	−11 14 6.6	10.1	3.8	0.26	16	22 33.4	22 11 37.96	−12 57 37.5	8.4	3.2	0.21
31	1 18.6	21 59 51.24	10 49 21.9	10.4	4.0	0.27	17	22 34.5	22 16 45.86	12 35 24.1	8.3	3.2	0.21
Feb. 1	1 15.2	22 0 24.87	10 28 0.4	10.7	4.1	0.27	18	22 35.8	22 21 58.83	12 11 50.1	8.2	3.1	0.21
2	1 11.1	22 0 17.35	10 10 24.1	11.0	4.2	0.28	19	22 37.2	22 27 16.59	11 46 56.5	8.1	3.1	0.21
3	1 6.4	21 59 28.29	9 56 52.4	11.4	4.3	0.29	20	22 38.6	22 32 38.92	11 20 44.3	8.0	3.0	0.20
4	1 1.0	21 57 58.27	− 9 47 39.3	11.8	4.4	0.30	21	22 40.1	22 38 5.61	−10 53 14.5	7.9	3.0	0.20
5	0 54.9	21 55 48.91	9 42 53.0	12.2	4.6	0.31	22	22 41.6	22 43 36.47	10 24 28.0	7.8	3.0	0.20
6	0 48.1	21 53 2.96	9 42 35.0	12.5	4.7	0.31	23	22 43.3	22 49 11.35	9 54 25.8	7.7	2.9	0.20
7	0 40.9	21 49 44.34	9 46 38.8	12.8	4.8	0.32	24	22 45.0	22 54 50.15	9 23 8.8	7.6	2.9	0.19
8	0 33.2	21 45 58.11	9 54 50.8	13.0	4.9	0.33	25	22 46.7	23 0 32.79	8 50 37.8	7.5	2.9	0.19
9	0 25.2	21 41 50.26	−10 6 49.6	13.2	5.0	0.34	26	22 48.6	23 6 19.19	− 8 16 53.8	7.5	2.8	0.19
10	0 16.9	21 37 27.44	10 22 7.6	13.4	5.1	0.35	27	22 50.4	23 12 9.33	7 41 57.7	7.4	2.8	0.19
11	0 8.4	21 32 56.73	10 40 12.2	13.5	5.1	0.35	28	22 52.4	23 18 3.21	7 5 50.5	7.4	2.8	0.19
12	0 0.0	21 28 25.26	11 0 28.0	13.5	5.1	0.35	29	22 54.4	23 24 0.83	6 28 32.9	7.3	2.7	0.18
12	23 51.7	21 23 59.75	11 22 18.7	13.6	5.2	0.35	30	22 56.5	23 30 2.22	5 50 5.8	7.3	2.7	0.18
13	23 43.5	21 19 46.44	−11 45 8.1	13.6	5.2	0.34	31	22 58.6	23 36 7.46	− 5 10 30.4	7.2	2.7	0.18
14	23 35.7	21 15 50.76	−12 8 22.9	13.6	5.2	0.34	Apr. 1	23 0.8	23 42 16.61	− 4 29 47.7	7.1	2.7	0.18

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi-diam.	Sid. T. of S.D. Pass. Mer.	Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi-diam.	Sid. T. of S.D. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
Apr. 1	23 0.8	23 42 16.61	− 4 29 47.7	7.1	2.7	0.18	May 17	1 28.3	5 7 33.44	+25 17 3.1	9.8	3.7	0.28
2	23 3.1	23 48 29.76	3 47 58.9	7.0	2.7	0.18	18	1 29.4	5 12 33.91	25 20 3.0	10.0	3.8	0.29
3	23 5.4	23 54 47.04	3 5 5.0	7.0	2.7	0.18	19	1 30.1	5 17 17.23	25 21 15.2	10.3	3.9	0.30
4	23 7.8	0 1 8.58	2 21 7.3	6.9	2.6	0.18	20	1 30.6	5 21 42.98	25 20 44.9	10.6	4.0	0.30
5	23 10.3	0 7 34.52	1 36 7.3	6.9	2.6	0.18	21	1 30.8	5 25 50.71	25 18 37.2	10.8	4.1	0.30
6	23 12.9	0 14 5.02	− 0 50 6.7	6.9	2.6	0.18	22	1 30.7	5 29 39.99	+25 14 56.9	11.1	4.2	0.30
7	23 15.5	0 20 40.26	− 0 3 7.2	6.8	2.6	0.18	23	1 30.3	5 33 10.42	25 9 48.8	11.3	4.3	0.31
8	23 18.3	0 27 20.44	+ 0 44 49.2	6.8	2.5	0.17	24	1 29.5	5 36 21.63	25 3 17.8	11.6	4.4	0.31
9	23 21.1	0 34 5.73	1 33 40.3	6.7	2.5	0.17	25	1 28.4	5 39 13.27	24 55 28.6	11.9	4.5	0.32
10	23 24.0	0 40 56.32	2 23 23.4	6.7	2.5	0.17	26	1 27.0	5 41 45.01	24 46 25.9	12.2	4.6	0.34
11	23 26.9	0 47 52.41	+ 3 13 55.5	6.7	2.5	0.17	27	1 25.3	5 43 56.60	+24 36 14.1	12.5	4.7	0.35
12	23 30.0	0 54 54.18	4 5 13.2	6.7	2.5	0.17	28	1 23.2	5 45 47.84	24 24 57.6	12.8	4.8	0.36
13	23 33.2	1 2 1.81	4 57 12.5	6.6	2.5	0.17	29	1 20.8	5 47 18.56	24 12 40.8	13.1	4.9	0.37
14	23 36.5	1 9 15.44	5 49 49.0	6.6	2.5	0.17	30	1 18.0	5 48 28.70	23 59 28.4	13.4	5.0	0.38
15	23 39.8	1 16 35.20	6 42 57.4	6.6	2.5	0.17	31	1 14.9	5 49 18.32	23 45 24.9	13.7	5.2	0.38
16	23 43.3	1 24 1.16	+ 7 36 31.7	6.6	2.5	0.17	June 1	1 11.4	5 49 47.61	+23 30 35.0	14.0	5.3	0.39
17	23 46.9	1 31 33.35	8 30 25.3	6.6	2.5	0.17	2	1 7.7	5 49 56.87	23 15 3.5	14.3	5.4	0.39
18	23 50.6	1 39 11.72	9 24 30.7	6.6	2.5	0.17	3	1 3.6	5 49 46.57	22 58 55.6	14.5	5.5	0.40
19	23 54.4	1 46 56.16	10 18 39.4	6.6	2.5	0.17	4	0 59.1	5 49 17.34	22 42 16.5	14.7	5.6	0.40
20	23 58.3	1 54 46.46	11 12 42.1	6.6	2.5	0.17	5	0 54.4	5 48 30.01	22 25 11.9	14.9	5.6	0.41
22	0 2.2	2 2 42.32	+12 6 28.5	6.7	2.5	0.17	6	0 49.4	5 47 25.62	+22 7 48.1	15.1	5.7	0.42
23	0 6.3	2 10 43.31	12 59 47.5	6.7	2.5	0.17	7	0 44.2	5 46 5.42	21 50 11.9	15.3	5.8	0.42
24	0 10.5	2 18 48.87	13 52 27.3	6.7	2.5	0.18	8	0 38.7	5 44 30.86	21 32 30.4	15.5	5.9	0.43
25	0 14.7	2 26 58.32	14 44 15.6	6.8	2.6	0.18	9	0 32.9	5 42 43.58	21 14 51.1	15.6	6.0	0.43
26	0 18.9	2 35 10.87	15 34 59.8	6.8	2.6	0.18	10	0 27.0	5 40 45.42	20 57 22.2	15.7	6.0	0.43
27	0 23.2	2 43 25.59	+16 24 27.0	6.9	2.6	0.18	11	0 21.0	5 38 38.40	+20 40 12.3	15.7	6.0	0.43
28	0 27.5	2 51 41.44	17 12 24.7	6.9	2.6	0.18	12	0 14.8	5 36 24.67	20 23 30.2	15.8	6.1	0.43
29	0 31.8	2 59 57.30	17 58 40.9	7.0	2.6	0.19	13	0 8.6	5 34 6.48	20 7 24.9	15.8	6.1	0.43
30	0 36.1	3 8 11.99	18 43 4.6	7.0	2.7	0.19	14	0 2.4	5 31 46.15	19 52 5.4	15.9	6.1	0.43
May 1	0 40.4	3 16 24.28	19 25 25.5	7.1	2.7	0.19	14	23 56.1	5 29 26.03	19 37 40.7	15.9	6.1	0.43
2	0 44.6	3 24 32.91	+20 5 34.7	7.2	2.7	0.19	15	23 49.9	5 27 8.45	+19 24 19.4	15.8	6.0	0.42
3	0 48.7	3 32 36.64	20 43 25.1	7.3	2.8	0.20	16	23 43.7	5 24 55.69	19 12 9.4	15.7	6.0	0.42
4	0 52.7	3 40 34.26	21 18 51.0	7.4	2.8	0.20	17	23 37.7	5 22 49.93	19 1 18.0	15.6	5.9	0.42
5	0 56.6	3 48 24.63	21 51 48.2	7.5	2.9	0.21	18	23 31.8	5 20 53.22	18 51 51.5	15.5	5.9	0.42
6	1 0.3	3 56 6.63	22 22 14.0	7.7	2.9	0.21	19	23 26.2	5 19 7.46	18 43 55.2	15.3	5.8	0.42
7	1 3.9	4 3 39.24	+22 50 7.3	7.8	2.9	0.22	20	23 20.7	5 17 34.35	+18 37 33.4	15.1	5.7	0.41
8	1 7.3	4 11 1.52	23 15 28.2	8.0	3.0	0.23	21	23 15.4	5 16 15.42	18 32 49.2	14.9	5.6	0.41
9	1 10.5	4 18 12.60	23 38 18.0	8.2	3.1	0.23	22	23 10.4	5 15 12.03	18 29 44.4	14.6	5.5	0.40
10	1 13.6	4 25 11.67	23 58 38.9	8.4	3.2	0.24	23	23 5.7	5 14 25.32	18 28 19.5	14.3	5.4	0.39
11	1 16.4	4 31 57.98	24 16 34.2	8.6	3.3	0.24	24	23 1.3	5 13 56.26	18 28 33.9	14.0	5.3	0.38
12	1 19.0	4 38 30.87	+24 32 7.5	8.8	3.3	0.25	25	22 57.2	5 13 45.65	+18 30 25.9	13.8	5.2	0.38
13	1 21.4	4 44 49.72	24 45 23.0	9.0	3.4	0.25	26	22 53.4	5 13 54.13	18 33 52.8	13.5	5.1	0.37
14	1 23.5	4 50 53.94	24 56 25.3	9.2	3.5	0.26	27	22 50.0	5 14 22.20	18 38 51.0	13.2	5.0	0.36
15	1 25.4	4 56 42.97	25 5 19.4	9.4	3.6	0.26	28	22 46.8	5 15 10.25	18 45 16.1	12.9	4.9	0.35
16	1 27.0	5 2 16.30	25 12 10.3	9.6	3.7	0.27	29	22 44.0	5 16 18.55	18 53 2.8	12.6	4.8	0.34
17	1 28.3	5 7 33.44	+25 17 3.1	9.8	3.7	0.28	30	22 41.6	5 17 47.30	+19 2 5.0	12.3	4.7	0.33
18	1 29.4	5 12 33.91	+25 20 3.0	10.0	3.8	0.29	July 1	22 39.5	5 19 36.64	+19 12 16.4	12.0	4.6	0.32

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi-diam.	Sid.T. of S.D. Pass. Mer.	Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi-diam.	Sid.T. of S.D. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
July 1	22 39.5	5 19 36.64	+19 12 16.4	12.0	4.6	0.32	Aug. 16	0 52.3	10 30 16.10	+10 51 42.6	6.6	2.5	0.17
2	22 37.7	5 21 46.64	19 23 29.9	11.7	4.5	0.31	17	0 55.0	10 36 54.60	10 7 15.4	6.7	2.5	0.17
3	22 36.3	5 24 17.32	19 35 37.8	11.4	4.4	0.30	18	0 57.6	10 43 25.40	9 22 34.9	6.7	2.5	0.17
4	22 35.2	5 27 8.69	19 48 32.3	11.1	4.2	0.30	19	1 0.0	10 49 48.76	8 37 45.4	6.7	2.6	0.17
5	22 34.4	5 30 20.72	20 2 5.0	10.8	4.1	0.30	20	1 2.3	10 56 4.93	7 52 50.6	6.7	2.6	0.17
6	22 34.0	5 33 53.37	+20 16 7.0	10.5	4.0	0.29	21	1 4.6	11 2 14.16	+ 7 7 54.2	6.8	2.6	0.17
7	22 34.0	5 37 46.58	20 30 29.2	10.2	3.9	0.28	22	1 6.6	11 8 16.69	6 22 59.6	6.8	2.6	0.18
8	22 34.3	5 42 0.28	20 45 1.9	10.0	3.8	0.27	23	1 8.6	11 14 12.74	5 38 9.9	6.9	2.6	0.18
9	22 34.9	5 46 34.37	20 59 35.2	9.8	3.7	0.26	24	1 10.5	11 20 2.52	4 53 28.1	6.9	2.6	0.18
10	22 35.8	5 51 28.71	21 13 58.7	9.5	3.6	0.26	25	1 12.3	11 25 46.23	4 8 56.9	6.9	2.6	0.18
11	22 37.1	5 56 43.16	+21 28 1.5	9.2	3.5	0.25	26	1 14.0	11 31 24.06	+ 3 24 39.0	7.0	2.6	0.18
12	22 38.8	6 2 17.52	21 41 32.4	9.0	3.4	0.24	27	1 15.6	11 36 56.17	2 40 36.8	7.0	2.7	0.18
13	22 40.7	6 8 11.51	21 54 19.9	8.8	3.3	0.24	28	1 17.1	11 42 22.72	1 56 52.7	7.1	2.7	0.18
14	22 43.0	6 14 24.79	22 6 12.2	8.6	3.3	0.23	29	1 18.5	11 47 43.84	1 13 29.0	7.2	2.7	0.18
15	22 45.6	6 20 56.95	22 16 57.3	8.4	3.2	0.23	30	1 19.8	11 52 59.63	+ 0 30 28.0	7.2	2.7	0.18
16	22 48.5	6 27 47.46	+22 26 23.0	8.2	3.2	0.22	31	1 21.0	11 58 10.19	− 0 12 8.1	7.3	2.8	0.18
17	22 51.7	6 34 55.63	22 34 17.1	8.0	3.1	0.22	Sept. 1	1 22.2	12 3 15.60	0 54 17.1	7.4	2.8	0.19
18	22 55.1	6 42 20.65	22 40 27.5	7.9	3.0	0.21	2	1 23.2	12 8 15.91	1 35 56.9	7.5	2.9	0.19
19	22 58.8	6 50 1.51	22 44 42.8	7.8	2.9	0.21	3	1 24.2	12 13 11.14	2 17 5.4	7.6	2.9	0.19
20	23 2.8	6 57 57.05	22 46 52.0	7.6	2.9	0.21	4	1 25.1	12 18 1.28	2 57 40.4	7.6	2.9	0.19
21	23 7.0	7 6 5.96	+22 46 45.3	7.4	2.8	0.20	5	1 25.9	12 22 46.30	− 3 37 39.5	7.7	2.9	0.19
22	23 11.4	7 14 26.74	22 44 14.1	7.3	2.8	0.20	6	1 26.6	12 27 26.16	4 17 0.5	7.8	2.9	0.19
23	23 16.0	7 22 57.74	22 39 11.1	7.2	2.7	0.19	7	1 27.2	12 32 0.76	4 55 41.0	7.9	3.0	0.20
24	23 20.7	7 31 37.21	22 31 30.8	7.1	2.7	0.19	8	1 27.8	12 36 29.96	5 33 38.5	8.0	3.0	0.20
25	23 25.5	7 40 23.29	22 21 9.7	7.0	2.7	0.19	9	1 28.2	12 40 53.59	6 10 50.4	8.1	3.0	0.20
26	23 30.4	7 49 14.10	+22 8 6.4	6.9	2.7	0.19	10	1 28.6	12 45 11.47	− 6 47 13.8	8.2	3.1	0.21
27	23 35.3	7 58 7.78	21 52 21.5	6.8	2.6	0.18	11	1 28.8	12 49 23.34	7 22 45.7	8.3	3.1	0.21
28	23 40.3	8 7 2.50	21 33 57.3	6.7	2.6	0.18	12	1 29.0	12 53 28.90	7 57 23.0	8.4	3.1	0.21
29	23 45.2	8 15 56.52	21 12 58.2	6.7	2.6	0.18	13	1 29.0	12 57 27.81	8 31 2.1	8.5	3.2	0.22
30	23 50.1	8 24 48.24	20 49 29.8	6.7	2.6	0.18	14	1 29.0	13 1 19.66	9 3 39.3	8.6	3.2	0.22
31	23 55.0	8 33 36.21	+20 23 39.4	6.6	2.6	0.17	15	1 28.8	13 5 3.98	− 9 35 10.4	8.7	3.3	0.23
Aug. 1	23 59.7	8 42 19.18	19 55 35.3	6.6	2.5	0.17	16	1 28.4	13 8 40.25	10 5 31.0	8.9	3.3	0.23
3	0 4.4	8 50 56.08	19 25 26.2	6.5	2.5	0.17	17	1 27.9	13 12 7.88	10 34 36.2	9.1	3.4	0.23
4	0 8.9	8 59 26.02	18 53 21.3	6.5	2.5	0.17	18	1 27.3	13 15 26.18	11 2 20.7	9.3	3.5	0.24
5	0 13.3	9 7 48.29	18 19 30.2	6.5	2.5	0.17	19	1 26.5	13 18 34.40	11 28 38.6	9.4	3.6	0.24
6	0 17.6	9 16 2.36	+17 44 2.5	6.5	2.5	0.17	20	1 25.5	13 21 31.70	−11 53 23.3	9.6	3.7	0.25
7	0 21.8	9 24 7.82	17 7 7.5	6.5	2.5	0.17	21	1 24.3	13 24 17.14	12 16 27.8	9.7	3.7	0.25
8	0 25.7	9 32 4.40	16 28 54.1	6.5	2.5	0.17	22	1 22.9	13 26 49.69	12 37 44.0	9.9	3.8	0.25
9	0 29.6	9 39 51.95	15 49 31.0	6.5	2.5	0.17	23	1 21.3	13 29 8.24	12 57 3.2	10.1	3.8	0.26
10	0 33.3	9 47 30.43	15 9 6.3	6.5	2.5	0.17	24	1 19.4	13 31 11.57	13 14 15.7	10.3	3.9	0.26
11	0 36.8	9 54 59.86	+14 27 47.8	6.5	2.5	0.17	25	1 17.3	13 32 58.36	−13 29 10.9	10.5	4.0	0.27
12	0 40.2	10 2 20.34	13 45 42.8	6.5	2.5	0.17	26	1 14.8	13 34 27.22	13 41 37.2	10.7	4.1	0.27
13	0 43.4	10 9 32.00	13 2 57.8	6.6	2.5	0.17	27	1 12.0	13 35 36.71	13 51 22.0	10.9	4.2	0.28
14	0 46.5	10 16 35.04	12 19 38.9	6.6	2.5	0.17	28	1 8.9	13 36 25.35	13 58 11.8	11.1	4.2	0.29
15	0 49.5	10 23 29.66	11 35 52.0	6.6	2.5	0.17	29	1 5.4	13 36 51.64	14 1 52.2	11.4	4.3	0.30
16	0 52.3	10 30 16.10	+10 51 42.6	6.6	2.5	0.17	30	1 1.5	13 36 54.15	−14 2 8.3	11.7	4.4	0.30
17	0 55.0	10 36 54.60	+10 7 15.4	6.7	2.5	0.17	Oct. 1	0 57.2	13 36 31.57	−13 58 44.9	11.9	4.5	0.31

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi-diam.	Sid. T. of S.D. Pass. Mer.	Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi-diam.	Sid.T. of S.D. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
Oct. 1	0 57.2	13 36 31.57	−13 58 44.9	11.9	4.5	0.31	Nov. 15	23 7.6	14 48 1.02	−15 11 36.5	6.4	2.4	0.17
2	0 52.5	13 35 42.82	13 51 27.1	12.1	4.6	0.31	16	23 9.9	14 54 14.47	15 46 8.9	6.4	2.4	0.17
3	0 47.3	13 34 27.12	13 40 0.7	12.3	4.7	0.32	17	23 12.2	15 0 29.70	16 20 1.6	6.3	2.4	0.17
4	0 41.6	13 32 44.13	13 24 14.2	12.5	4.8	0.32	18	23 14.6	15 6 46.66	16 53 11.6	6.3	2.4	0.17
5	0 35.5	13 30 34.09	13 3 59.8	12.7	4.8	0.33	19	23 16.9	15 13 5.33	17 25 36.3	6.2	2.4	0.17
6	0 29.0	13 27 57.96	−12 39 14.1	12.9	4.9	0.33	20	23 19.3	15 19 25.70	−17 57 13.4	6.2	2.4	0.17
7	0 22.1	13 24 57.58	12 10 0.9	13.1	4.9	0.34	21	23 21.7	15 25 47.76	18 28 0.5	6.2	2.4	0.17
8	0 14.8	13 21 35.75	11 36 32.6	13.2	5.0	0.35	22	23 24.2	15 32 11.52	18 57 55.5	6.2	2.4	0.17
9	0 7.2	13 17 56.28	10 59 11.9	13.2	5.0	0.35	23	23 26.6	15 38 37.00	19 26 56.5	6.2	2.4	0.17
9	23 59.4	13 14 3.99	10 18 32.7	13.3	5.0	0.35	24	23 29.2	15 45 4.21	19 55 1.7	6.2	2.3	0.17
10	23 51.5	13 10 4.62	− 9 35 20.1	13.3	5.0	0.34	25	23 31.7	15 51 33.18	−20 22 9.2	6.1	2.3	0.17
11	23 43.6	13 6 4.59	8 50 29.3	13.2	5.0	0.34	26	23 34.2	15 58 3.93	20 48 17.4	6.1	2.3	0.17
12	23 35.8	13 2 10.75	8 5 4.2	13.1	5.0	0.33	27	23 36.8	16 4 36.49	21 13 24.9	6.1	2.3	0.17
13	23 28.2	12 58 30.03	7 20 13.0	12.9	4.9	0.33	28	23 39.5	16 11 10.87	21 37 30.1	6.1	2.3	0.17
14	23 20.9	12 55 9.02	6 37 4.4	12.7	4.8	0.32	29	23 42.1	16 17 47.09	22 0 31.2	6.0	2.3	0.17
15	23 14.1	12 52 13.72	− 5 56 44.1	12.5	4.7	0.32	30	23 44.8	16 24 25.14	−22 22 26.8	6.0	2.3	0.17
16	23 7.7	12 49 49.12	5 20 10.8	12.2	4.6	0.31	Dec. 1	23 47.5	16 31 5.04	22 43 15.4	6.0	2.3	0.17
17	23 2.0	12 47 59.13	4 48 12.5	11.9	4.5	0.30	2	23 50.3	16 37 46.78	23 2 55.6	6.0	2.3	0.17
18	22 56.8	12 46 46.42	4 21 26.0	11.6	4.4	0.29	3	23 53.0	16 44 30.35	23 21 25.9	6.0	2.3	0.17
19	22 52.3	12 46 12.43	4 0 15.0	11.3	4.3	0.29	4	23 55.8	16 51 15.74	23 38 44.9	6.0	2.3	0.17
20	22 48.5	12 46 17.46	− 3 44 51.8	11.0	4.2	0.28	5	23 58.7	16 58 2.92	−23 54 51.1	6.1	2.3	0.17
21	22 45.3	12 47 0.81	3 35 17.8	10.7	4.1	0.27	7	0 1.6	17 4 51.86	24 9 43.1	6.1	2.3	0.17
22	22 42.7	12 48 20.95	3 31 25.2	10.3	3.9	0.26	8	0 4.4	17 11 42.50	24 23 19.5	6.1	2.3	0.17
23	22 40.6	12 50 15.80	3 32 58.6	10.0	3.8	0.25	9	0 7.4	17 18 34.77	24 35 38.9	6.1	2.3	0.17
24	22 39.2	12 52 42.80	3 39 37.9	9.7	3.7	0.25	10	0 10.3	17 25 28.60	24 46 39.8	6.1	2.3	0.17
25	22 38.2	12 55 39.16	− 3 50 58.8	9.4	3.6	0.24	11	0 13.3	17 32 23.90	−24 56 20.7	6.1	2.3	0.17
26	22 37.6	12 59 1.98	4 6 35.3	9.1	3.5	0.24	12	0 16.3	17 39 20.59	25 4 40.4	6.2	2.3	0.17
27	22 37.4	13 2 48.40	4 26 0.2	8.8	3.4	0.23	13	0 19.3	17 46 18.56	25 11 37.6	6.2	2.4	0.18
28	22 37.6	13 6 55.67	4 48 46.7	8.6	3.3	0.23	14	0 22.3	17 53 17.65	25 17 11.0	6.2	2.4	0.18
29	22 38.1	13 11 21.17	5 14 28.7	8.4	3.2	0.22	15	0 25.4	18 0 17.71	25 21 19.2	6.2	2.4	0.18
30	22 38.8	13 16 2.50	− 5 42 41.5	8.2	3.2	0.21	16	0 28.4	18 7 18.59	−25 24 0.9	6.3	2.4	0.18
31	22 39.8	13 20 57.55	6 13 2.1	8.0	3.1	0.21	17	0 31.5	18 14 20.10	25 25 14.9	6.3	2.4	0.18
Nov. 1	22 41.0	13 26 4.40	6 45 9.2	7.8	3.1	0.20	18	0 34.6	18 21 22.00	25 25 0.2	6.3	2.4	0.18
2	22 42.3	13 31 21.35	7 18 43.9	7.6	3.0	0.20	19	0 37.7	18 28 24.07	25 23 15.7	6.4	2.4	0.18
3	22 43.8	13 36 46.95	7 53 28.8	7.5	2.9	0.19	20	0 40.8	18 35 26.07	25 20 0.5	6.4	2.4	0.18
4	22 45.4	13 42 19.98	− 8 29 8.3	7.4	2.8	0.19	21	0 43.8	18 42 27.68	−25 15 13.8	6.4	2.5	0.18
5	22 47.1	13 47 59.31	9 5 28.7	7.3	2.7	0.18	22	0 46.9	18 49 28.57	25 8 54.8	6.5	2.5	0.18
6	22 48.9	13 53 44.08	9 42 17.8	7.2	2.7	0.18	23	0 49.9	18 56 28.40	25 1 3.0	6.5	2.5	0.19
7	22 50.8	13 59 33.51	10 19 24.9	7.1	2.7	0.18	24	0 53.0	19 3 26.75	24 51 38.1	6.6	2.5	0.19
8	22 52.7	14 5 26.99	10 56 40.5	7.0	2.6	0.18	25	0 56.0	19 10 23.16	24 40 39.9	6.7	2.5	0.19
9	22 54.7	14 11 23.99	−11 33 56.2	6.9	2.6	0.18	26	0 58.9	19 17 17.12	−24 28 8.6	6.8	2.6	0.19
10	22 56.8	14 17 24.08	12 11 4.6	6.8	2.5	0.18	27	1 1.8	19 24 8.07	24 14 4.8	6.9	2.6	0.19
11	22 58.9	14 23 26.91	12 47 59.3	6.7	2.5	0.18	28	1 4.6	19 30 55.37	23 58 29.2	6.9	2.7	0.19
12	23 1.0	14 29 32.23	13 24 34.6	6.6	2.5	0.17	29	1 7.4	19 37 38.29	23 41 23.1	7.0	2.8	0.20
13	23 3.2	14 35 39.78	14 0 45.6	6.5	2.5	0.17	30	1 10.1	19 44 16.01	23 22 48.3	7.1	2.8	0.20
14	23 5.4	14 41 49.42	−14 36 27.6	6.5	2.5	0.17	31	1 12.7	19 50 47.62	−23 2 47.6	7.2	2.8	0.20
15	23 7.6	14 48 1.02	−15 11 36.5	6.4	2.4	0.17	32	1 15.1	19 57 12.07	−22 41 23.9	7.3	2.8	0.21

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi-diam.	Sid. T. of S.D. Pass. Mer.	Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi-diam.	Sid.T. of S.D. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
Jan. 0	22 0.8	16 43 20.08	−21 3 47.7	6.2	6.0	0.43	Feb. 15	23 4.7	20 48 46.01	−18 35 46.7	5.5	5.3	0.38
1	22 2.2	16 48 36.22	21 15 33.0	6.2	6.0	0.43	16	23 5.9	20 53 52.45	18 17 33.5	5.5	5.3	0.37
2	22 3.5	16 53 53.26	21 26 41.6	6.2	6.0	0.43	17	23 7.0	20 58 57.76	17 58 48.8	5.5	5.3	0.37
3	22 4.8	16 59 11.17	21 37 13.2	6.2	6.0	0.43	18	23 8.2	21 4 1.92	17 39 33.2	5.5	5.3	0.37
4	22 6.2	17 4 29.93	21 47 7.3	6.2	6.0	0.43	19	23 9.3	21 9 4.93	17 19 47.3	5.4	5.2	0.36
5	22 7.6	17 9 49.50	−21 56 23.3	6.1	5.9	0.43	20	23 10.4	21 14 6.77	−16 59 32.0	5.4	5.2	0.36
6	22 9.0	17 15 9.82	22 5 0.7	6.1	5.9	0.43	21	23 11.4	21 19 7.45	16 38 48.0	5.4	5.2	0.36
7	22 10.4	17 20 30.84	22 12 59.1	6.1	5.9	0.43	22	23 12.5	21 24 6.96	16 17 35.9	5.4	5.2	0.36
8	22 11.8	17 25 52.53	22 20 18.2	6.1	5.9	0.42	23	23 13.5	21 29 5.30	15 55 56.4	5.4	5.2	0.35
9	22 13.2	17 31 14.84	22 26 57.5	6.0	5.8	0.42	24	23 14.5	21 34 2.49	15 33 50.2	5.4	5.2	0.35
10	22 14.7	17 36 37.72	−22 32 56.7	6.0	5.8	0.42	25	23 15.5	21 38 58.55	−15 11 18.2	5.4	5.2	0.35
11	22 16.1	17 42 1.11	22 38 15.5	6.0	5.8	0.42	26	23 16.5	21 43 53.47	14 48 21.0	5.4	5.2	0.35
12	22 17.6	17 47 24.96	22 42 53.5	6.0	5.8	0.42	27	23 17.4	21 48 47.26	14 24 59.4	5.4	5.2	0.35
13	22 19.0	17 52 49.22	22 46 50.5	6.0	5.8	0.42	28	23 18.3	21 53 39.94	14 1 14.0	5.4	5.2	0.35
14	22 20.5	17 58 13.84	22 50 6.2	5.9	5.7	0.41	Mar. 1	23 19 2	21 58 31.53	13 37 5.6	5.4	5.2	0.35
15	22 21.9	18 3 38.75	−22 52 40.5	5.9	5.7	0.41	2	23 20.1	22 3 22.04	−13 12 34.9	5.3	5.1	0.35
16	22 23.4	18 9 3.89	22 54 33.1	5.9	5.7	0.41	3	23 21.0	22 8 11.49	12 47 42.8	5.3	5.1	0.34
17	22 24.9	18 14 29.20	22 55 43.9	5.9	5.7	0.41	4	23 21.9	22 12 59.92	12 22 29.9	5.3	5.1	0.34
18	22 26.4	18 19 54.62	22 56 12.8	5.9	5.7	0.41	5	23 22.8	22 17 47.33	11 56 57.0	5.3	5.1	0.34
19	22 27.9	18 25 20.09	22 55 59.8	5.8	5.6	0.41	6	23 23.6	22 22 33.75	11 31 4.8	5.3	5.1	0.34
20	22 29.3	18 30 45.55	−22 55 4.7	5.8	5.6	0.41	7	23 24.4	22 27 19.20	−11 4 54.0	5.3	5.1	0.34
21	22 30.8	18 36 10.92	22 53 27.6	5.8	5.6	0.41	8	23 25.2	22 32 3.73	10 38 25.2	5.3	5.1	0.34
22	22 32.3	18 41 36.15	22 51 8.5	5.8	5.6	0.41	9	23 26.0	22 36 47.38	10 11 39.3	5.3	5.1	0.34
23	22 33.8	18 47 1.18	22 48 7.5	5.8	5.6	0.41	10	23 26.7	22 41 30.16	9 44 37.1	5.3	5.1	0.34
24	22 35.2	18 52 25.94	22 44 24.6	5.8	5.6	0.41	11	23 27.5	22 46 12.10	9 17 19.3	5.3	5.1	0.34
25	22 36.7	18 57 50.38	−22 40 0.1	5.8	5.6	0.41	12	23 28.2	22 50 53.24	− 8 49 46.6	5.3	5.1	0.34
26	22 38.1	19 3 14.45	22 34 54.0	5.8	5 6	0.41	13	23 28.9	22 55 33.60	8 21 59.7	5.3	5.1	0.34
27	22 39.6	19 8 38.09	22 29 6.5	5.7	5.5	0.40	14	23 29.7	23 0 13.22	7 53 59.3	5.2	5.0	0.34
28	22 41.0	19 14 1.24	22 22 37.9	5.7	5.5	0.40	15	23 30.4	23 4 52.13	7 25 46.1	5.2	5.0	0.34
29	22 42.4	19 19 23.84	22 15 28.5	5.7	5.5	0.40	16	23 31.1	23 9 30.38	6 57 20.8	5.2	5.0	0.34
30	22 43.9	19 24 45.86	−22 7 38.5	5.7	5.5	0.40	17	23 31.8	23 14 7.99	− 6 28 44.2	5.2	5.0	0.34
31	22 45.3	19 30 7.26	21 59 8.2	5.7	5.5	0.40	18	23 32.4	23 18 44.99	5 59 57.1	5.2	5.0	0.34
Feb. 1	22 46.7	19 35 27.99	21 49 57.9	5.7	5.5	0.39	19	23 33.1	23 23 21.42	5 31 0.3	5.2	5.0	0.34
2	22 48.1	19 40 47.99	21 40 8.1	5.6	5.4	0.39	20	23 33.7	23 27 57.32	5 1 54.7	5.2	5.0	0.34
3	22 49.4	19 46 7.22	21 29 39.1	5.6	5.4	0.39	21	23 34.4	23 32 32.72	4 32 40.8	5.2	5.0	0.34
4	22 50.8	19 51 25.65	−21 18 31.4	5.6	5.4	0.39	22	23 35.0	23 37 7.65	− 4 3 19.2	5.2	5.0	0.34
5	22 52.2	19 56 43.23	21 6 45.3	5.6	5.4	0.39	23	23 35.7	23 41 42.16	3 33 50.7	5.2	5.0	0.34
6	22 53.5	20 1 59.94	20 54 21.3	5.6	5.4	0.39	24	23 36.3	23 46 16.29	3 4 16.2	5.2	5.0	0.34
7	22 54.8	20 7 15.75	20 41 19.9	5.6	5.4	0.39	25	23 36.9	23 50 50.09	2 34 36.4	5.2	5.0	0.33
8	22 56.1	20 12 30.62	20 27 41.7	5.6	5.4	0.39	26	23 37.5	23 55 23.57	2 4 52.0	5.2	5.0	0.33
9	22 57.4	20 17 44.51	−20 13 27.0	5.6	5.4	0.38	27	23 38.1	23 59 56.77	− 1 35 3.7	5.2	5.0	0.33
10	22 58.7	20 22 57.39	19 58 36.4	5.5	5.3	0.38	28	23 38.7	0 4 29.75	1 5 12.3	5.2	5.0	0.33
11	22 59.9	20 28 9.24	19 43 10.6	5.5	5.3	0.38	29	23 39.3	0 9 2.55	0 35 18.4	5.2	5.0	0.33
12	23 1.1	20 33 20.04	19 27 10.1	5.5	5.3	0.38	30	23 39.9	0 13 35.22	− 0 5 22.7	5.2	5.0	0.33
13	23 2.4	20 38 29.79	19 10 35.6	5.5	5.3	0.38	31	23 40.5	0 18 7.79	+ 0 24 34.0	5.2	5.0	0.33
14	23 3.5	20 43 38.45	−18 53 27.6	5.5	5.3	0.38	Apr. 1	23 41.1	0 22 40.31	+ 0 54 31.0	5.1	4.9	0.33
15	23 4.7	20 48 46.01	−18 35 46.7	5.5	5.3	0.38	2	23 41.7	0 27 12.81	+ 1 24 27.7	5.1	4.9	0.33

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi-diam.	Sid. T. of S.D. Pass. Mer.	Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi-diam.	Sid. T. of S.D. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
Apr. 1	23 41.1	0 22 40.31	+ 0 54 31.0	5.1	4.9	0.33	May 17	0 17.3	3 56 19.72	+20 13 17.1	5.1	4.9	0.35
2	23 41.7	0 27 12.81	1 24 27.7	5.1	4.9	0.33	18	0 18.4	4 1 26.52	20 30 26.5	5.1	4.9	0.35
3	23 42.3	0 31 45.34	1 54 23.3	5.1	4.9	0.33	19	0 19.6	4 6 34.42	20 47 2.3	5.1	4.9	0.35
4	23 42.9	0 36 17.95	2 24 17.2	5.1	4.9	0.33	20	0 20.8	4 11 43.39	21 3 3.8	5.1	4.9	0.35
5	23 43.5	0 40 50.69	2 54 8.5	5.1	4.9	0.33	21	0 22.0	4 16 53.41	21 18 30.5	5.1	4.9	0.35
6	23 44.1	0 45 23.58	+ 3 23 56.6	5.1	4.9	0.33	22	0 23.3	4 22 4.45	+21 33 21.7	5.1	4.9	0.35
7	23 44.7	0 49 56.68	3 53 40.9	5.1	4.9	0.33	23	0 24.5	4 27 16.48	21 47 36.9	5.1	4.9	0.35
8	23 45.3	0 54 30.02	4 23 20.5	5.1	4.9	0.33	24	0 25.8	4 32 29.48	22 1 15.4	5.1	4.9	0.35
9	23 45.9	0 59 3.65	4 52 54.8	5.1	4.9	0.33	25	0 27.1	4 37 43.40	22 14 16.6	5.1	4.9	0.35
10	23 46.6	1 3 37.61	5 22 23.2	5.1	4.9	0.33	26	0 28.4	4 42 58.22	22 26 40.0	5.1	4.9	0.35
11	23 47.2	1 8 11.96	+ 5 51 44.9	5.1	4.9	0.33	27	0 29.7	4 48 13.89	+22 38 25.1	5.1	4.9	0.36
12	23 47.9	1 12 46.72	6 20 59.1	5.1	4.9	0.33	28	0 31.0	4 53 30.39	22 49 31.4	5.2	5.0	0.36
13	23 48.5	1 17 21.93	6 50 5.1	5.1	4.9	0.33	29	0 32.4	4 58 47.67	22 59 58.4	5.2	5.0	0.36
14	23 49.1	1 21 57.63	7 19 2.2	5.1	4.9	0.33	30	0 33.7	5 4 5.70	23 9 45.7	5.2	5.0	0.36
15	23 49.8	1 26 33.85	7 47 49.7	5.1	4.9	0.33	31	0 35.1	5 9 24.44	23 18 52.9	5.2	5.0	0.36
16	23 50.5	1 31 10.65	+ 8 16 26.9	5.1	4.9	0.33	June 1	0 36.5	5 14 43.83	+23 27 19.5	5.2	5.0	0.36
17	23 51.1	1 35 48.04	8 44 53.0	5.1	4.9	0.33	2	0 37.9	5 20 3.82	23 35 5.2	5.2	5.0	0.36
18	23 51.8	1 40 26.07	9 13 7.3	5.1	4.9	0.33	3	0 39.3	5 25 24.37	23 42 9.6	5.2	5.0	0.36
19	23 52.5	1 45 4.77	9 41 8.9	5.1	4.9	0.33	4	0 40.7	5 30 45.43	23 48 32.5	5.2	5.0	0.36
20	23 53.2	1 49 44.17	10 8 57.2	5.1	4.9	0.33	5	0 42.1	5 36 6.94	23 54 13.6	5.2	5.0	0.37
21	23 54.0	1 54 24.31	+10 36 31.4	5.1	4.9	0.33	6	0 43.5	5 41 28.83	+23 59 12.5	5.2	5.0	0.37
22	23 54.7	1 59 5.21	11 3 50.8	5.1	4.9	0.33	7	0 44.9	5 46 51.07	24 3 28.9	5.2	5.0	0.37
23	23 55.4	2 3 46.91	11 30 54.5	5.1	4.9	0.33	8	0 46.3	5 52 13.61	24 7 2.7	5.2	5.0	0.37
24	23 56.2	2 8 29.42	11 57 41.8	5.1	4.9	0.33	9	0 47.8	5 57 36.40	24 9 53.9	5.2	5.0	0.37
25	23 57.0	2 13 12.79	12 24 11.9	5.1	4.9	0.34	10	0 49.2	6 2 59.37	24 12 2.2	5.2	5.0	0.37
26	23 57.8	2 17 57.05	+12 50 24.3	5.1	4.9	0.34	11	0 50.6	6 8 22.44	+24 13 27.5	5.2	5.0	0.37
27	23 58.6	2 22 42.21	13 16 18.2	5.1	4.9	0.34	12	0 52.1	6 13 45.57	24 14 9.7	5.2	5.0	0.37
28	23 59.4	2 27 28.30	13 41 52.7	5.1	4.9	0.34	13	0 53.5	6 19 8.70	24 14 8.8	5.3	5.1	0.37
30	0 0.3	2 32 15.36	14 7 7.2	5.1	4.9	0.34	14	0 55.0	6 24 31.76	24 13 24.7	5.3	5.1	0.37
May 1	0 1.1	2 37 3.41	14 32 0.9	5.1	4.9	0.34	15	0 56.4	6 29 54.69	24 11 57.5	5.3	5.1	0.37
2	0 2.0	2 41 52.47	+14 56 33.1	5.1	4.9	0.34	16	0 57.8	6 35 17.43	+24 9 47.2	5.3	5.1	0.37
3	0 2.9	2 46 42.56	15 20 43.0	5.1	4.9	0.34	17	0 59.3	6 40 39.92	24 6 53.8	5.3	5.1	0.37
4	0 3.8	2 51 33.70	15 44 29.9	5.1	4.9	0.34	18	1 0.7	6 46 2.09	24 3 17.5	5.3	5.1	0.37
5	0 4.7	2 56 25.90	16 7 53.0	5.1	4.9	0.34	19	1 2.2	6 51 23.88	23 58 58.4	5.3	5.1	0.37
6	0 5.7	3 1 19.19	16 30 51.7	5.1	4.9	0.34	20	1 3.5	6 56 45.22	23 53 56.7	5.3	5.1	0.37
7	0 6.6	3 6 13.58	+16 53 25.2	5.1	4.9	0.34	21	1 4.9	7 2 6.05	+23 48 12.6	5.3	5.1	0.37
8	0 7.6	3 11 9.09	17 15 32.8	5.1	4.9	0.34	22	1 6.3	7 7 26.32	23 41 46.3	5.3	5.1	0.37
9	0 8.6	3 16 5.72	17 37 13.7	5.1	4.9	0.34	23	1 7.7	7 12 45.97	23 34 38.1	5.3	5.1	0.37
10	0 9.6	3 21 3.48	17 58 27.2	5.1	4.9	0.34	24	1 9.1	7 18 4.95	23 26 48.3	5.4	5.2	0.38
11	0 10.6	3 26 2.38	18 19 12.7	5.1	4.9	0.34	25	1 10.4	7 23 23.20	23 18 17.1	5.4	5.2	0.38
12	0 11.7	3 31 2.43	+18 39 29.4	5.1	4.9	0.35	26	1 11.8	7 28 40.68	+23 9 5.0	5.4	5.2	0.38
13	0 12.8	3 36 3.62	18 59 16.7	5.1	4.9	0.35	27	1 13.1	7 33 57.33	22 59 12.4	5.4	5.2	0.38
14	0 13.9	3 41 5.96	19 18 33.9	5.1	4.9	0.35	28	1 14.4	7 39 13.11	22 48 39.7	5.4	5.2	0.38
15	0 15.0	3 46 9.43	19 37 20.1	5.1	4.9	0.35	29	1 15.7	7 44 27.97	22 37 27.3	5.4	5.2	0.38
16	0 16.1	3 51 14.02	19 55 34.7	5.1	4.9	0.35	30	1 17.0	7 49 41.87	22 25 35.7	5.4	5.2	0.38
17	0 17.3	3 56 19.72	+20 13 17.1	5.1	4.9	0.35	July 1	1 18.3	7 54 54.77	+22 13 5.3	5.4	5.2	0.38
18	0 18.4	4 1 26.52	+20 30 26.5	5.1	4.9	0.35	2	1 19.5	8 0 6.65	+21 59 56.5	5.4	5.2	0.38

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi-diam.	Sid.T. of S.D. Pass. Mer.	Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi-diam.	Sid.T. of S.D. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
July 1	1 18.3	7 54 54.77	+22 13 5.3	5.4	5.2	0.38	Aug. 16	1 56.0	11 34 7.17	+ 4 1 18.2	6.3	6.1	0.41
2	1 19.5	8 0 6.65	21 59 56.5	5.4	5.2	0.38	17	1 56.5	11 38 31.33	3 30 44.0	6.3	6.1	0.41
3	1 20.7	8 5 17.47	21 46 10.0	5.5	5.3	0.38	18	1 56.9	11 42 55.06	3 0 3.6	6.3	6.1	0.41
4	1 22.0	8 10 27.20	21 31 46.3	5.5	5.3	0.38	19	1 57.4	11 47 18.38	2 29 17.7	6.3	6.1	0.41
5	1 23.2	8 15 35.82	21 16 46.0	5.5	5.3	0.38	20	1 57.8	11 51 41.34	1 58 27.2	6.4	6.2	0.41
6	1 24.4	8 20 43.29	+21 1 9.5	5.5	5.3	0.38	21	1 58.2	11 56 3.98	+ 1 27 32.7	6.4	6.2	0.41
7	1 25.5	8 25 49.58	20 44 57.5	5.5	5.3	0.38	22	1 58.7	12 0 26.34	0 56 35.0	6.4	6.2	0.41
8	1 26.6	8 30 54.69	20 28 10.5	5.5	5.3	0.38	23	1 59.1	12 4 48.47	+ 0 25 34.7	6.4	6.2	0.41
9	1 27.8	8 35 58.61	20 10 49.2	5.5	5.3	0.38	24	1 59.5	12 9 10.39	− 0 5 27.5	6.5	6.3	0.42
10	1 28.9	8 41 1.31	19 52 54.2	5.5	5.3	0.38	25	1 59.9	12 13 32.15	0 36 30.8	6.5	6.3	0.42
11	1 29.9	8 46 2.78	+19 34 26.1	5.6	5.4	0.38	26	2 0.3	12 17 53.78	− 1 7 34.6	6.5	6.3	0.42
12	1 31.0	8 51 3.02	19 15 25.5	5.6	5.4	0.38	27	2 0.8	12 22 15.32	1 38 38.2	6.6	6.4	0.43
13	1 32.0	8 56 2.01	18 55 53.1	5.6	5.4	0.38	28	2 1.2	12 26 36.82	2 9 40.8	6.6	6.4	0.43
14	1 33.1	9 0 59.74	18 35 49.6	5.6	5.4	0.38	29	2 1.6	12 30 58.32	2 40 41.8	6.6	6.4	0.43
15	1 34.1	9 5 56.20	18 15 15.8	5.6	5.4	0.38	30	2 2.0	12 35 19.86	3 11 40.6	6.6	6.4	0.43
16	1 35.0	9 10 51.40	+17 54 12.3	5.6	5.4	0.38	31	2 2.4	12 39 41.48	− 3 42 36.4	6.7	6.5	0.43
17	1 36.0	9 15 45.33	17 32 39.7	5.7	5.5	0.38	Sept. 1	2 2.8	12 44 3.23	4 13 28.5	6.7	6.5	0.44
18	1 36.9	9 20 37.97	17 10 38.7	5.7	5.5	0.38	2	2 3.3	12 48 25.15	4 44 16.3	6.7	6.5	0.44
19	1 37.8	9 25 29.35	16 48 10.1	5.7	5.5	0.38	3	2 3.7	12 52 47.29	5 14 59.2	6.8	6.6	0.44
20	1 38.7	9 30 19.49	16 25 14.7	5.7	5.5	0.38	4	2 4.1	12 57 9.68	5 45 36.4	6.8	6.6	0.44
21	1 39.6	9 35 8.37	+16 1 53.2	5.7	5.5	0.38	5	2 4.5	13 1 32.37	− 6 16 7.2	6.8	6.6	0.44
22	1 40.4	9 39 56.00	15 38 6.2	5.7	5.5	0.38	6	2 5.0	13 5 55.40	6 46 31.1	6.9	6.7	0.45
23	1 41.3	9 44 42.40	15 13 54.5	5.8	5.6	0.39	7	2 5.4	13 10 18.81	7 16 47.3	6.9	6.7	0.45
24	1 42.1	9 49 27.57	14 49 18.8	5.8	5.6	0.39	8	2 5.9	13 14 42.63	7 46 55.1	6.9	6.7	0.45
25	1 42.9	9 54 11.54	14 24 20.0	5.8	5.6	0.39	9	2 6.3	13 19 6.90	8 16 53.8	7.0	6.8	0.46
26	1 43.6	9 58 54.32	+13 58 58.7	5.8	5.6	0.39	10	2 6.8	13 23 31.67	− 8 46 42.7	7.0	6.8	0.46
27	1 44.4	10 3 35.93	13 33 15.6	5.8	5.6	0.39	11	2 7.3	13 27 56.98	9 16 21.2	7.1	6.9	0.47
28	1 45.1	10 8 16.39	13 7 11.5	5.8	5.6	0.39	12	2 7.8	13 32 22.85	9 45 48.6	7.1	6.9	0.47
29	1 45.8	10 12 55.73	12 40 47.2	5.9	5.7	0.39	13	2 8.3	13 36 49.30	10 15 4.1	7.1	6.9	0.47
30	1 46.5	10 17 33.98	12 14 3.4	5.9	5.7	0.39	14	2 8.8	13 41 16.38	10 44 7.0	7.2	7.0	0.48
31	1 47.2	10 22 11.16	+11 47 0.7	5.9	5.7	0.39	15	2 9.3	13 45 44.12	−11 12 56.6	7.2	7.0	0.48
Aug. 1	1 47.8	10 26 47.29	11 19 39.9	5.9	5.7	0.39	16	2 9.8	13 50 12.56	11 41 32.0	7.2	7.0	0.48
2	1 48.5	10 31 22.40	10 52 1.8	5.9	5.7	0.39	17	2 10.4	13 54 41.71	12 9 52.6	7.3	7.1	0.49
3	1 49.1	10 35 56.53	10 24 7.0	6.0	5.8	0.39	18	2 10.9	13 59 11.61	12 37 57.6	7.3	7.1	0.49
4	1 49.7	10 40 29.72	9 55 56.3	6.0	5.8	0.39	19	2 11.5	14 3 42.28	13 5 46.4	7.3	7.1	0.49
5	1 50.3	10 45 2.00	+ 9 27 30.3	6.0	5.8	0.39	20	2 12.1	14 8 13.75	−13 33 18.2	7.4	7.2	0.50
6	1 50.9	10 49 33.40	8 58 49.8	6.0	5.8	0.39	21	2 12.7	14 12 46.04	14 0 32.3	7.4	7.2	0.50
7	1 51.5	10 54 3.96	8 29 55.4	6.0	5.8	0.39	22	2 13.3	14 17 19.17	14 27 27.8	7.5	7.3	0.50
8	1 52.0	10 58 33.72	8 0 47.9	6.1	5.9	0.40	23	2 13.9	14 21 53.15	14 54 4.1	7.5	7.3	0.51
9	1 52.5	11 3 2.71	7 31 27.9	6.1	5.9	0.40	24	2 14.5	14 26 28.02	15 20 20.4	7.6	7.4	0.51
10	1 53.1	11 7 30.96	+ 7 1 56.1	6.1	5.9	0.40	25	2 15.2	14 31 3.79	−15 46 16.0	7.6	7.4	0.52
11	1 53.6	11 11 58.52	6 32 13.2	6.1	5.9	0.40	26	2 15.9	14 35 40.47	16 11 50.1	7.7	7.5	0.52
12	1 54.1	11 16 25.42	6 2 20.0	6.2	6.0	0.40	27	2 16.6	14 40 18.09	16 37 2.1	7.7	7.5	0.52
13	1 54.6	11 20 51.70	5 32 17.3	6.2	6.0	0.40	28	2 17.2	14 44 56.66	17 1 51.3	7.8	7.6	0.53
14	1 55.1	11 25 17.40	5 2 5.6	6.2	6.0	0.40	29	2 17.9	14 49 36.19	17 26 16.9	7.8	7.6	0.53
15	1 55.5	11 29 42.54	+ 4 31 45.6	6.2	6.0	0.40	30	2 18.7	14 54 16.70	−17 50 18.1	7.8	7.6	0.53
16	1 56.0	11 34 7.17	+ 4 1 18.2	6.3	6.1	0.41	Oct. 1	2 19.4	14 58 58.20	−18 13 54.3	7.9	7.6	0.54

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi-diam.	Sid. T. of S.D. Pass. Mer.	Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi-diam.	Sid. T. of S.D. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
Oct. 1	2 19.4	14 58 58.20	−18 13 54.3	7.9	7.6	0.54	Nov. 16	3 5.1	18 46 4.60	−26 2 23.9	11.2	10.9	0.81
2	2 20.2	15 3 40.69	18 37 4.7	7.9	7.6	0.54	17	3 6.0	18 50 55.04	25 57 6.4	11.3	11.0	0.82
3	2 21.0	15 8 24.18	18 59 48.8	8.0	7.7	0.55	18	3 6.8	18 55 44.00	25 51 9.9	11.4	11.1	0.83
4	2 21.8	15 13 8.69	19 22 5.9	8.0	7.8	0.55	19	3 7.7	19 0 31.38	25 44 34.8	11.5	11.2	0.84
5	2 22.6	15 17 54.22	19 43 55.3	8.1	7.8	0.55	20	3 8.5	19 5 17.09	25 37 21.6	11.6	11.3	0.84
6	2 23.4	15 22 40.77	−20 5 16.2	8.1	7.9	0.56	21	3 9.3	19 10 1.04	−25 29 30.8	11.7	11.4	0.85
7	2 24.3	15 27 28.34	20 26 7.9	8.2	7.9	0.56	22	3 10.0	19 14 43.14	25 21 2.9	11.8	11.5	0.86
8	2 25.1	15 32 16.91	20 46 29.9	8.3	8.0	0.57	23	3 10.7	19 19 23.31	25 11 58.4	11.9	11.6	0.86
9	2 26.0	15 37 6.48	21 6 21.5	8.3	8.0	0.57	24	3 11.4	19 24 1.47	25 2 17.9	12.1	11.7	0.87
10	2 26.9	15 41 57.04	21 25 41.9	8.4	8.1	0.58	25	3 12.1	19 28 37.53	24 52 2.2	12.2	11.8	0.87
11	2 27.8	15 46 48.55	−21 44 30.4	8.4	8.1	0.58	26	3 12.7	19 33 11.42	−24 41 12.0	12.3	12.0	0.88
12	2 28.8	15 51 41.01	22 2 46.5	8.5	8.2	0.59	27	3 13.3	19 37 43.07	24 29 47.8	12.4	12.1	0.89
13	2 29.7	15 56 34.40	22 20 29.7	8.5	8.2	0.59	28	3 13.9	19 42 12.41	24 17 50.4	12.5	12.2	0.90
14	2 30.7	16 1 28.69	22 37 39.3	8.6	8.3	0.60	29	3 14.4	19 46 39.36	24 5 20.5	12.7	12.3	0.90
15	2 31.6	16 6 23.84	22 54 14.5	8.7	8.4	0.61	30	3 14.8	19 51 3.84	23 52 18.8	12.8	12.5	0.91
16	2 32.6	16 11 19.84	−23 10 14.7	8.7	8.4	0.61	Dec. 1	3 15.2	19 55 25.77	−23 38 46.1	13.0	12.6	0.92
17	2 33.6	16 16 16.64	23 25 39.5	8.8	8.5	0.62	2	3 15.6	19 59 45.10	23 24 43.1	13.1	12.8	0.93
18	2 34.6	16 21 14.19	23 40 28.3	8.9	8.6	0.63	3	3 16.0	20 4 1.77	23 10 10.8	13.3	12.9	0.94
19	2 35.6	16 26 12.45	23 54 40.5	8.9	8.6	0.63	4	3 16.3	20 8 15.72	22 55 9.9	13.4	13.1	0.95
20	2 36.7	16 31 11.37	24 8 15.6	9.0	8.7	0.64	5	3 16.5	20 12 26.87	22 39 41.2	13.6	13.2	0.96
21	2 37.7	16 36 10.91	−24 21 13.0	9.0	8.7	0.64	6	3 16.7	20 16 35.15	−22 23 45.6	13.8	13.4	0.97
22	2 38.8	16 41 11.01	24 33 32.3	9.1	8.8	0.65	7	3 16.8	20 20 40.48	22 7 24.1	13.9	13.5	0.97
23	2 39.9	16 46 11.62	24 45 13.1	9.2	8.9	0.66	8	3 16.9	20 24 42.79	21 50 37.5	14.1	13.7	0.98
24	2 40.9	16 51 12.68	24 56 14.9	9.3	9.0	0.66	9	3 17.0	20 28 42.02	21 33 26.6	14.2	13.8	0.99
25	2 42.0	16 56 14.12	25 6 37.4	9.3	9.0	0.67	10	3 17.0	20 32 38.08	21 15 52.4	14.4	14.0	1.01
26	2 43.1	17 1 15.89	−25 16 20.2	9.4	9.1	0.67	11	3 16.9	20 36 30.90	−20 57 55.9	14.6	14.2	1.02
27	2 44.2	17 6 17.93	25 25 23.0	9.5	9.2	0.68	12	3 16.8	20 40 20.40	20 39 38.1	14.8	14.3	1.03
28	2 45.3	17 11 20.16	25 33 45.4	9.5	9.2	0.68	13	3 16.6	20 44 6.50	20 20 59.9	15.0	14.5	1.04
29	2 46.4	17 16 22.53	25 41 27.2	9.6	9.3	0.69	14	3 16.4	20 47 49.12	20 2 2.4	15.2	14.7	1.05
30	2 47.5	17 21 24.97	25 48 28.1	9.7	9.4	0.70	15	3 16.1	20 51 28.17	19 42 46.7	15.4	14.9	1.06
31	2 48.6	17 26 27.41	−25 54 48.0	9.8	9.5	0.71	16	3 15.7	20 55 3.55	−19 23 13.8	15.6	15.1	1.07
Nov. 1	2 49.7	17 31 29.79	26 0 26.7	9.9	9.6	0.71	17	3 15.3	20 58 35.17	19 3 24.7	15.8	15.3	1.08
2	2 50.8	17 36 32.02	26 5 24.1	10.0	9.7	0.72	18	3 14.8	21 2 2.94	18 43 20.4	16.0	15.5	1.09
3	2 51.9	17 41 34.04	26 9 40.0	10.0	9.7	0.72	19	3 14.3	21 5 26.76	18 23 2.2	16.2	15.7	1.10
4	2 52.9	17 46 35.78	26 13 14.3	10.1	9.8	0.73	20	3 13.7	21 8 46.53	18 2 31.4	16.4	15.9	1.12
5	2 54.0	17 51 37.16	−26 16 7.0	10.2	9.9	0.74	21	3 13.0	21 12 2.13	−17 41 49.0	16.6	16.1	1.13
6	2 55.1	17 56 38.08	26 18 18.2	10.3	10.0	0.75	22	3 12.2	21 15 13.45	17 20 56.4	16.8	16.3	1.15
7	2 56.1	18 1 38.49	26 19 47.8	10.4	10.1	0.75	23	3 11.4	21 18 20.39	16 59 54.6	17.1	16.6	1.16
8	2 57.2	18 6 38.30	26 20 35.9	10.4	10.1	0.76	24	3 10.5	21 21 22.85	16 38 44.8	17.3	16.8	1.18
9	2 58.2	18 11 37.41	26 20 42.6	10.5	10.2	0.77	25	3 9.5	21 24 20.70	16 17 28.4	17.6	17.1	1.19
10	2 59.2	18 16 35.75	−26 20 8.0	10.6	10.3	0.77	26	3 8.5	21 27 13.82	−15 56 6.6	17.8	17.3	1.20
11	3 0.3	18 21 33.23	26 18 52.2	10.7	10.4	0.78	27	3 7.4	21 30 2.10	15 34 40.6	18.1	17.6	1.22
12	3 1.3	18 26 29.75	26 16 55.4	10.8	10.5	0.78	28	3 6.2	21 32 45.42	15 13 11.7	18.3	17.8	1.23
13	3 2.2	18 31 25.24	26 14 17.9	10.9	10.6	0.79	29	3 4.9	21 35 23.64	14 51 41.3	18.6	18.1	1.25
14	3 3.2	18 36 19.61	26 11 0.0	11.0	10.7	0.80	30	3 3.5	21 37 56.64	14 30 10.7	18.9	18.4	1.27
15	3 4.1	18 41 12.76	−26 7 1.9	11.1	10.8	0.80	31	3 2.0	21 40 24.29	−14 8 41.3	19.2	18.7	1.29
16	3 5.1	18 46 4.60	−26 2 23.9	11.2	10.9	0.81	32	3 0.4	21 42 46.45	−13 47 14.5	19.5	19.0	1.31

FOR TRANSIT AT WASHINGTON.

Date.		Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi-diam.	Sid.T. o S.D. Pass. Mer.	Date.		Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi-diam.	Sid.T. of S.D. Pass. Mer.
		h m	h m s	° ′ ″	″	″	s			h m	h m s	° ′ ″	″	″	s
July	1	16 55.5	23 34 42.67	−6 45 0.4	12.7	7.3	0.49	Aug.	16	14 52.3	0 32 32.54	−2 17 38.9	19.1	11.0	0.73
	2	16 53.5	23 36 37.36	6 35 13.3	12.8	7.3	0.49		17	14 48.7	0 32 50.94	2 17 15.2	19.3	11.1	0.73
	3	16 51.5	23 38 30.87	6 25 33.0	12.9	7.4	0.50		18	14 45.0	0 33 6.18	2 17 7.3	19.4	11.2	0.74
	4	16 49.4	23 40 23.18	6 15 59.8	13.0	7.5	0.51		19	14 41.2	0 33 18.26	2 17 15.1	19.6	11.3	0.75
	5	16 47.3	23 42 14.26	6 6 34.0	13.1	7.6	0.51		20	14 37.4	0 33 27.18	2 17 38.2	19.8	11.4	0.75
	6	16 45.2	23 44 4.07	−5 57 15.9	13.2	7.6	0.51		21	14 33.6	0 33 32.92	−2 18 16.6	19.9	11.5	0.76
	7	16 43.1	23 45 52.55	5 48 5.7	13.4	7.7	0.52		22	14 29.7	0 33 35.48	2 19 10.1	20.0	11.5	0.76
	8	16 40.9	23 47 39.67	5 39 3.7	13.5	7.7	0.52		23	14 25.8	0 33 34.84	2 20 18.3	20.2	11.6	0.77
	9	16 38.7	23 49 25.41	5 30 10.3	13.7	7.8	0.53		24	14 21.8	0 33 31.00	2 21 40.9	20.4	11.7	0.78
	10	16 36.5	23 51 9.73	5 21 25.7	13.8	7.9	0.53		25	14 17.7	0 33 23.95	2 23 17.6	20.5	11.8	0.78
	11	16 34.3	23 52 52.59	−5 12 50.3	14.0	8.0	0.54		26	14 13.6	0 33 13.71	−2 25 8.1	20.7	11.9	0.79
	12	16 32.1	23 54 33.94	5 4 24.3	14.1	8.0	0.54		27	14 9.5	0 33 0.29	2 27 12.1	20.8	11.9	0.79
	13	16 29.8	23 56 13.75	4 56 8.1	14.2	8.1	0.55		28	14 5.3	0 32 43.72	2 29 29.3	21.0	12.0	0.80
	14	16 27.5	23 57 51.97	4 48 2.0	14.3	8.2	0.55		29	14 1.0	0 32 24.00	2 31 59.3	21.1	12.1	0.81
	15	16 25.2	23 59 28.56	4 40 6.1	14.4	8.3	0.56		30	13 56.7	0 32 1.17	2 34 41.7	21.2	12.1	0.81
	16	16 22.8	0 1 3.49	−4 32 20.7	14.5	8.3	0.56		31	13 52.3	0 31 35.26	−2 37 36.1	21.4	12.2	0.82
	17	16 20.4	0 2 36.71	4 24 46.1	14.7	8.4	0.57	Sept.	1	13 47.9	0 31 6.31	2 40 41.9	21.5	12.3	0.82
	18	16 18.0	0 4 8.19	4 17 22.6	14.8	8.5	0.58		2	13 43.5	0 30 34.35	2 43 58.5	21.6	12.3	0.83
	19	16 15.6	0 5 37.90	4 10 10.2	14.9	8.6	0.58		3	13 39.0	0 29 59.41	2 47 25.4	21.7	12.4	0.83
	20	16 13.1	0 7 5.80	4 3 9.3	15.1	8.7	0.59		4	13 34.4	0 29 21.54	2 51 2.3	21.8	12.5	0.83
	21	16 10.6	0 8 31.85	−3 56 19.9	15.2	8.7	0.59		5	13 29.8	0 28 40.83	−2 54 48.7	21.9	12.6	0.84
	22	16 8.1	0 9 56.00	3 49 42.4	15.4	8.8	0.60		6	13 25.1	0 27 57.35	2 58 43.7	22.0	12.6	0.84
	23	16 5.5	0 11 18.22	3 43 16.8	15.5	8.9	0.60		7	13 20.4	0 27 11.19	3 2 46.4	22.1	12.7	0.85
	24	16 2.9	0 12 38.48	3 37 3.4	15.7	9.0	0.61		8	13 15.6	0 26 22.45	3 6 56.2	22.2	12.7	0.85
	25	16 0.2	0 13 56.75	3 31 2.4	15.8	9.1	0.61		9	13 10.8	0 25 31.24	3 11 12.2	22.3	12.7	0.85
	26	15 57.5	0 15 12.97	−3 25 14.0	15.9	9.2	0.61		10	13 6.0	0 24 37.70	−3 15 33.5	22.4	12.8	0.85
	27	15 54.8	0 16 27.10	3 19 38.5	16.1	9.3	0.62		11	13 1.2	0 23 41.96	3 19 59.1	22.4	12.8	0.86
	28	15 52.1	0 17 39.10	3 14 15.9	16.2	9.4	0.62		12	12 56.4	0 22 44.16	3 24 27.9	22.5	12.9	0.86
	29	15 49.4	0 18 48.92	3 9 6.5	16.4	9.5	0.63		13	12 51.5	0 21 44.44	3 28 58.9	22.5	12.9	0.86
	30	15 46.6	0 19 56.52	3 4 10.3	16.5	9.5	0.63		14	12 46.5	0 20 42.97	3 33 31.2	22.5	12.9	0.86
	31	15 43.7	0 21 1.85	−2 59 27.5	16.7	9.6	0.63		15	12 41.5	0 19 39.92	−3 38 3.7	22.5	12.9	0.87
Aug.	1	15 40.8	0 22 4.86	2 54 58.6	16.8	9.7	0.64		16	12 36.5	0 18 35.47	3 42 35.3	22.5	13.0	0.87
	2	15 37.9	0 23 5.48	2 50 43.7	17.0	9.8	0.64		17	12 31.5	0 17 29.79	3 47 4.9	22.6	13.0	0.87
	3	15 35.0	0 24 3.66	2 46 43.0	17.1	9.9	0.65		18	12 26.5	0 16 23.05	3 51 31.4	22.6	13.0	0.87
	4	15 32.0	0 24 59.35	2 42 56.9	17.3	9.9	0.66		19	12 21.5	0 15 15.45	3 55 53.7	22.6	13.0	0.87
	5	15 28.9	0 25 52.50	−2 39 25.4	17.4	10.0	0.66		20	12 16.4	0 14 7.18	−4 0 10.8	22.6	13.0	0.87
	6	15 25.8	0 26 43.04	2 36 8.7	17.6	10.1	0.67		21	12 11.3	0 12 58.42	4 4 21.6	22.5	12.9	0.86
	7	15 22.7	0 27 30.90	2 33 7.0	17.7	10.2	0.67		22	12 6.2	0 11 49.36	4 8 25.2	22.5	12.9	0.86
	8	15 19.5	0 28 16.02	2 30 20.7	17.9	10.3	0.68		23	12 1.1	0 10 40.19	4 12 20.6	22.5	12.9	0.86
	9	15 16.3	0 28 58.35	2 27 49.9	18.0	10.4	0.69		24	11 56.0	0 9 31.10	4 16 6.9	22.4	12.9	0.86
	10	15 13.0	0 29 37.83	−2 25 34.9	18.2	10.5	0.70		25	11 50.9	0 8 22.27	−4 19 43.3	22.4	12.8	0.86
	11	15 9.7	0 30 14.42	2 23 35.8	18.3	10.6	0.70		26	11 45.8	0 7 13.88	4 23 9.0	22.3	12.8	0.85
	12	15 6.3	0 30 48.07	2 21 52.6	18.5	10.6	0.71		27	11 40.7	0 6 6.11	4 26 23.3	22.3	12.8	0.85
	13	15 2.9	0 31 18.75	2 20 25.3	18.6	10.7	0.71		28	11 35.7	0 4 59.11	4 29 25.4	22.2	12.7	0.85
	14	14 59.4	0 31 46.41	2 19 14.0	18.8	10.8	0.72		29	11 30.7	0 3 53.03	4 32 14.7	22.1	12.7	0.85
	15	14 55.9	0 32 11.02	−2 18 18.5	19.0	10.9	0.72		30	11 25.7	0 2 48.02	−4 34 50.4	22.0	12.6	0.84
	16	14 52.3	0 32 32.54	−2 17 38.9	19.1	11.0	0.73	Oct.	1	11 20.7	0 1 44.24	−4 37 12.0	21.9	12.6	0.84

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi-diam.	Sid. T. of S.D. Pass. Mer.	Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi-diam.	Sid. T. of S.D. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
Oct. 1	11 20.7	0 1 44.24	−4 37 12.0	21.9	12.6	0.84	Nov. 16	8 15.9	23 57 45.64	−1 29 52.2	14.2	8.1	0.53
2	11 15.7	0 0 41.84	4 39 19.0	21.8	12.5	0.83	17	8 12.9	23 58 41.76	1 20 18.1	14.0	8.0	0.53
3	11 10.7	23 59 40.97	4 41 11.1	21.7	12.5	0.83	18	8 9.9	23 59 39.98	1 10 34.0	13.8	7.9	0.52
4	11 5.8	23 58 41.76	4 42 47.8	21.6	12.4	0.83	19	8 7.0	0 0 40.25	1 0 40.4	13.7	7.8	0.52
5	11 0.9	23 57 44.34	4 44 8.7	21.4	12.3	0.82	20	8 4.1	0 1 42.51	0 50 37.5	13.5	7.8	0.51
6	10 56.1	23 56 48.85	−4 45 13.4	21.3	12.3	0.82	21	8 1.2	0 2 46.71	−0 40 25.5	13.4	7.7	0.51
7	10 51.3	23 55 55.42	4 46 1.5	21.1	12.2	0.81	22	7 58.4	0 3 52.80	0 30 4.8	13.2	7.6	0.50
8	10 46.5	23 55 4.19	4 46 32.5	21.0	12.1	0.81	23	7 55.6	0 5 0.73	0 19 35.7	13.1	7.5	0.50
9	10 41.8	23 54 15.27	4 46 46.1	20.8	12.0	0.81	24	7 52.8	0 6 10.46	−0 8 58.4	13.0	7.4	0.49
10	10 37.1	23 53 28.77	4 46 42.0	20.6	11.9	0.80	25	7 50.1	0 7 21.96	+0 1 46.8	12.8	7.4	0.49
11	10 32.5	23 52 44.79	−4 46 20.0	20.5	11.8	0.80	26	7 47.4	0 8 35.16	+0 12 39.6	12.7	7.3	0.48
12	10 27.9	23 52 3.41	4 45 39.9	20.3	11.7	0.79	27	7 44.7	0 9 50.01	0 23 39.6	12.5	7.2	0.48
13	10 23.3	23 51 24.71	4 44 41.7	20.2	11.6	0.78	28	7 42.0	0 11 6.47	0 34 46.6	12.4	7.1	0.47
14	10 18.8	23 50 48.76	4 43 25.3	20.0	11.5	0.77	29	7 39.4	0 12 24.51	0 46 0.4	12.3	7.0	0.47
15	10 14.3	23 50 15.63	4 41 50.7	19.9	11.4	0.76	30	7 36.8	0 13 44.08	0 57 20.8	12.2	7.0	0.46
16	10 9.9	23 49 45.38	−4 39 57.8	19.7	11.3	0.76	Dec. 1	7 34.2	0 15 5.16	+1 8 47.6	12.0	6.9	0.46
17	10 5.5	23 49 18.05	4 37 46.7	19.6	11.2	0.75	2	7 31.6	0 16 27.72	1 20 20.5	11.9	6.8	0.45
18	10 1.1	23 48 53.68	4 35 17.3	19.4	11.1	0.74	3	7 29.1	0 17 51.74	1 31 59.4	11.8	6.7	0.45
19	9 56.8	23 48 32.31	4 32 29.7	19.2	11.0	0.73	4	7 26.6	0 19 17.19	1 43 44.0	11.7	6.6	0.44
20	9 52.6	23 48 13.95	4 29 24.2	19.0	10.9	0.72	5	7 24.1	0 20 44.04	1 55 34.2	11.5	6.5	0.44
21	9 48.4	23 47 58.61	−4 26 1.0	18.8	10.8	0.72	6	7 21.6	0 22 12.27	+2 7 29.8	11.4	6.5	0.43
22	9 44.3	23 47 46.28	4 22 20.2	18.6	10.7	0.71	7	7 19.2	0 23 41.83	2 19 30.6	11.2	6.4	0.43
23	9 40.2	23 47 36.97	4 18 22.0	18.4	10.6	0.71	8	7 16.8	0 25 12.70	2 31 36.5	11.1	6.3	0.43
24	9 36.2	23 47 30.68	4 14 6.8	18.2	10.5	0.70	9	7 14.4	0 26 44.85	2 43 47.3	11.0	6.3	0.43
25	9 32.2	23 47 27.38	4 9 34.9	18.0	10.3	0.69	10	7 12.0	0 28 18.25	2 56 2.8	10.9	6.2	0.42
26	9 28.3	23 47 27.04	−4 4 46.6	17.9	10.2	0.69	11	7 9.6	0 29 52.89	+3 8 22.9	10.8	6.2	0.42
27	9 24.4	23 47 29.61	3 59 42.3	17.7	10.1	0.68	12	7 7.3	0 31 28.75	3 20 47.4	10.7	6.1	0.41
28	9 20.5	23 47 35.10	3 54 22.3	17.5	10.0	0.68	13	7 5.0	0 33 5.81	3 33 16.1	10.6	6.1	0.41
29	9 16.7	23 47 43.46	3 48 46.9	17.3	9.9	0.67	14	7 2.7	0 34 44.03	3 45 48.8	10.5	6.0	0.41
30	9 13.0	23 47 54.65	3 42 56.5	17.1	9.8	0.66	15	7 0.4	0 36 23.38	3 58 25.4	10.3	5.9	0.40
31	9 9.3	23 48 8.65	−3 36 51.4	17.0	9.7	0.66	16	6 58.1	0 38 3.84	+4 11 5.6	10.2	5.9	0.40
Nov. 1	9 5.6	23 48 25.44	3 30 31.8	16.8	9.6	0.65	17	6 55.9	0 39 45.39	4 23 49.3	10.1	5.8	0.39
2	9 2.0	23 48 44.96	3 23 58.2	16.6	9.5	0.64	18	6 53.7	0 41 28.00	4 36 36.3	10.0	5.8	0.38
3	8 58.5	23 49 7.18	3 17 10.8	16.4	9.4	0.63	19	6 51.5	0 43 11.64	4 49 26.3	9.9	5.7	0.38
4	8 55.0	23 49 32.06	3 10 9.8	16.2	9.3	0.62	20	6 49.3	0 44 56.30	5 2 19.2	9.8	5.6	0.37
5	8 51.5	23 49 59.58	−3 2 55.5	16.1	9.2	0.62	21	6 47.1	0 46 41.95	+5 15 14.7	9.7	5.6	0.37
6	8 48.0	23 50 29.71	2 55 28.1	15.9	9.1	0.61	22	6 44.9	0 48 28.55	5 28 12.5	9.6	5.5	0.37
7	8 44.6	23 51 2.42	2 47 47.9	15.7	9.0	0.60	23	6 42.7	0 50 16.08	5 41 12.5	9.5	5.5	0.37
8	8 41.3	23 51 37.65	2 39 55.1	15.5	8.9	0.59	24	6 40.6	0 52 4.52	5 54 14.5	9.4	5.4	0.37
9	8 38.0	23 52 15.37	2 31 50.0	15.3	8.8	0.58	25	6 38.5	0 53 53.86	6 7 18.3	9.3	5.4	0.36
10	8 34.7	23 52 55.53	−2 23 32.8	15.1	8.7	0.58	26	6 36.4	0 55 44.07	+6 20 23.7	9.2	5.3	0.36
11	8 31.5	23 53 38.10	2 15 3.9	15.0	8.6	0.57	27	6 34.3	0 57 35.14	6 33 30.6	9.2	5.3	0.35
12	8 28.3	23 54 23.04	2 6 23.5	14.8	8.5	0.56	28	6 32.3	0 59 27.05	6 46 38.7	9.1	5.3	0.35
13	8 25.2	23 55 10.30	1 57 31.9	14.6	8.4	0.55	29	6 30.2	1 1 19.78	6 59 47.9	9.0	5.3	0.35
14	8 22.1	23 55 59.85	1 48 29.3	14.5	8.3	0.54	30	6 28.2	1 3 13.32	7 12 58.1	8.9	5.2	0.34
15	8 19.0	23 56 51.65	−1 39 16.0	14.3	8.2	0.54	31	6 26.2	1 5 7.67	+7 26 9.1	8.8	5.2	0.34
16	8 15.9	23 57 45.64	−1 29 52.2	14.2	8.1	0.53	32	6 24.1	1 7 2.82	+7 39 20.9	8.8	5.1	0.34

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi-diam.	Sid. T. of S.D. Pass. Mer.	Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi-diam.	Sid. T. of S.D. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
Jan. 0	16 23.2	11 4 49.17	+7 11 47.4	1.8	19.1	1.37	Feb. 15	13 10.3	10 52 41.27	+ 8 38 11.8	2.0	21.1	1.52
1	16 19.3	11 4 47.95	7 12 13.0	1.8	19.2	1.37	16	13 5.9	10 52 13.69	8 41 9.3	2.0	21.1	1.52
2	16 15.3	11 4 46.03	7 12 42.9	1.8	19.3	1.38	17	13 1.5	10 51 45.85	8 44 7.8	2.0	21.2	1.52
3	16 11.3	11 4 43.39	7 13 17.3	1.8	19.3	1.38	18	12 57.1	10 51 17.77	8 47 7.2	2.0	21.2	1.53
4	16 7.3	11 4 40.04	7 13 56.1	1.8	19.4	1.39	19	12 52.7	10 50 49.47	8 50 7.5	2.0	21.2	1.53
5	16 3.3	11 4 35.97	+7 14 39.3	1.8	19.4	1.39	20	12 48.3	10 50 20.97	+ 8 53 8.6	2.0	21.2	1.53
6	15 59.3	11 4 31.19	7 15 27.0	1.8	19.5	1.40	21	12 43.9	10 49 52.30	8 56 10.2	2.0	21.3	1.53
7	15 55.3	11 4 25.70	7 16 19.1	1.8	19.5	1.40	22	12 39.5	10 49 23.48	8 59 12.1	2.0	21.3	1.53
8	15 51.3	11 4 19.50	7 17 15.5	1.8	19.6	1.41	23	12 35.0	10 48 54.52	9 2 14.4	2.0	21.3	1.53
9	15 47.3	11 4 12.59	7 18 16.2	1.8	19.6	1.41	24	12 30.6	10 48 25.44	9 5 16.9	2.0	21.3	1.53
10	15 43.2	11 4 4.98	+7 19 21.3	1.8	19.7	1.42	25	12 26.2	10 47 56.28	+ 9 8 19.3	2.0	21.3	1.53
11	15 39.1	11 3 56.66	7 20 30.6	1.8	19.8	1.42	26	12 21.8	10 47 27.05	9 11 21.5	2.0	21.3	1.53
12	15 35.0	11 3 47.64	7 21 44.1	1.9	19.8	1.43	27	12 17.4	10 46 57.77	9 14 23.4	2.0	21.3	1.53
13	15 30.9	11 3 37.92	7 23 1.8	1.9	19.9	1.43	28	12 13.0	10 46 28.47	9 17 25.0	2.0	21.3	1.53
14	15 26.8	11 3 27.50	7 24 23.8	1.9	19.9	1.43	Mar. 1	12 8.6	10 45 59.17	9 20 25.9	2.0	21.3	1.53
15	15 22.7	11 3 16.39	+7 25 50.0	1.9	20.0	1.44	2	12 4.1	10 45 29.89	+ 9 23 26.1	2.0	21.3	1.53
16	15 18.6	11 3 4.60	7 27 20.2	1.9	20.0	1.44	3	11 59.7	10 45 0.65	9 26 25.7	2.0	21.3	1.53
17	15 14.5	11 2 52.14	7 28 54.4	1.9	20.1	1.44	4	11 55.3	10 44 31.45	9 29 24.4	2.0	21.3	1.53
18	15 10.3	11 2 39.01	7 30 32.7	1.9	20.1	1.44	5	11 50.8	10 44 2.33	9 32 22.0	2.0	21.3	1.53
19	15 6.2	11 2 25.21	7 32 15.0	1.9	20.2	1.44	6	11 46.4	10 43 33.30	9 35 18.5	2.0	21.3	1.53
20	15 2.0	11 2 10.76	+7 34 1.1	1.9	20.2	1.45	7	11 42.0	10 43 4.38	+ 9 38 13.8	2.0	21.3	1.53
21	14 57.8	11 1 55.66	7 35 51.0	1.9	20.3	1.45	8	11 37.6	10 42 35.60	9 41 7.7	2.0	21.3	1.53
22	14 53.6	11 1 39.91	7 37 44.7	1.9	20.3	1.45	9	11 33.2	10 42 6.99	9 44 0.0	2.0	21.3	1.53
23	14 49.4	11 1 23.52	7 39 42.1	1.9	20.4	1.46	10	11 28.8	10 41 38.56	9 46 50.6	2.0	21.2	1.53
24	14 45.2	11 1 6.51	7 41 43.1	1.9	20.4	1.46	11	11 24.4	10 41 10.34	9 49 39.5	2.0	21.2	1.53
25	14 41.0	11 0 48.89	+7 43 47.7	1.9	20.5	1.46	12	11 20.0	10 40 42.33	+ 9 52 26.6	2.0	21.2	1.52
26	14 36.7	11 0 30.67	7 45 55.7	1.9	20.5	1.47	13	11 15.6	10 40 14.55	9 55 11.8	2.0	21.2	1.52
27	14 32.5	11 0 11.87	7 48 7.0	1.9	20.6	1.47	14	11 11.2	10 39 47.02	9 57 54.9	2.0	21.1	1.52
28	14 28.2	10 59 52.51	7 50 21.5	1.9	20.6	1.47	15	11 6.8	10 39 19.75	10 0 35.9	2.0	21.1	1.52
29	14 24.0	10 59 32.59	7 52 39.3	1.9	20.6	1.48	16	11 2.5	10 38 52.76	10 3 14.6	2.0	21.1	1.52
30	14 19.7	10 59 12.11	+7 55 0.3	1.9	20.7	1.48	17	10 58.1	10 38 26.10	+10 5 50.9	2.0	21.1	1.52
31	14 15.4	10 58 51.09	7 57 24.3	1.9	20.7	1.48	18	10 53.7	10 37 59.77	10 8 24.8	2.0	21.1	1.52
Feb. 1	14 11.1	10 58 29.55	7 59 51.1	1.9	20.8	1.49	19	10 49.3	10 37 33.78	10 10 56.1	2.0	21.0	1.52
2	14 6.8	10 58 7.51	8 2 20.7	1.9	20.8	1.49	20	10 45.0	10 37 8.17	10 13 24.8	2.0	21.0	1.52
3	14 2.5	10 57 44.97	8 4 53.0	1.9	20.9	1.50	21	10 40.6	10 36 42.95	10 15 50.7	2.0	21.0	1.51
4	13 58.2	10 57 21.95	+8 7 27.8	1.9	20.9	1.50	22	10 36.3	10 36 18.13	+10 18 13.8	2.0	20.9	1.51
5	13 53.9	10 56 58.46	8 10 5.1	2.0	20.9	1.50	23	10 32.0	10 35 53.74	10 20 34.0	2.0	20.9	1.51
6	13 49.6	10 56 34.52	8 12 44.8	2.0	21.0	1.50	24	10 27.7	10 35 29.79	10 22 51.1	1.9	20.9	1.51
7	13 45.2	10 56 10.14	8 15 26.8	2.0	21.0	1.50	25	10 23.4	10 35 6.30	10 25 5.1	1.9	20.9	1.51
8	13 40.9	10 55 45.34	8 18 11.0	2.0	21.0	1.51	26	10 19.1	10 34 43.27	10 27 15.9	1.9	20.8	1.51
9	13 36.5	10 55 20.12	+8 20 57.2	2.0	21.1	1.51	27	10 14.8	10 34 20.72	+10 29 23.3	1.9	20.8	1.50
10	13 32.2	10 54 54.51	8 23 45.4	2.0	21.1	1.51	28	10 10.5	10 33 58.66	10 31 27.3	1.9	20.8	1.50
11	13 27.8	10 54 28.54	8 26 35.5	2.0	21.1	1.51	29	10 6.2	10 33 37.12	10 33 27.9	1.9	20.7	1.50
12	13 23.5	10 54 2.22	8 29 27.3	2.0	21.1	1.51	30	10 1.9	10 33 16.10	10 35 25.1	1.9	20.7	1.50
13	13 19.1	10 53 35.56	8 32 20.7	2.0	21.1	1.51	31	9 57.6	10 32 55.61	10 37 18.9	1.9	20.7	1.49
14	13 14.7	10 53 8.57	+8 35 15.6	2.0	21.1	1.52	Apr. 1	9 53.3	10 32 35.66	+10 39 9.1	1.9	20.6	1.49
15	13 10.3	10 52 41.27	+8 38 11.8	2.0	21.1	1.52	2	9 49.1	10 32 16.27	+10 40 55.7	1.9	20.6	1.49

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi-diam.	Sid. T. of S.D. Pass. Mer.	Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi-diam.	Sid.T. of S.D. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
Apr. 1	9 53.3	10 32 35.66	+10 39 9.1	1.9	20.6	1.49	May 17	6 48.9	10 28 58.19	+10 52 22.6	1.7	18.1	1.32
2	9 49.1	10 32 16.27	10 40 55.7	1.9	20.6	1.49	18	6 45.1	10 29 9.28	10 51 6.4	1.7	18.0	1.32
3	9 44.9	10 31 57.46	10 42 38.6	1.9	20.5	1.49	19	6 41.4	10 29 21.03	10 49 46.4	1.7	18.0	1.31
4	9 40.6	10 31 39.23	10 44 17.8	1.9	20.5	1.49	20	6 37.6	10 29 33.41	10 48 22.8	1.7	18.0	1.31
5	9 36.4	10 31 21.58	10 45 53.2	1.9	20.4	1.48	21	6 33.9	10 29 46.41	10 46 55.7	1.7	17.9	1.31
6	9 32.2	10 31 4.52	+10 47 24.8	1.9	20.4	1.48	22	6 30.2	10 30 0.05	+10 45 24.9	1.7	17.9	1.30
7	9 28.0	10 30 48.07	10 48 52.6	1.9	20.3	1.48	23	6 26.5	10 30 14.31	10 43 50.4	1.7	17.8	1.30
8	9 23.8	10 30 32.22	10 50 16.6	1.9	20.3	1.47	24	6 22.8	10 30 29.19	10 42 12.3	1.7	17.8	1.29
9	9 19.6	10 30 16.99	10 51 36.8	1.9	20.2	1.47	25	6 19.1	10 30 44.68	10 40 30.7	1.7	17.8	1.29
10	9 15.4	10 30 2.39	10 52 53.0	1.9	20.2	1.47	26	6 15.4	10 31 0.79	10 38 45.7	1.7	17.7	1.28
11	9 11.2	10 29 48.42	+10 54 5.3	1.9	20.1	1.46	27	6 11.8	10 31 17.48	+10 36 57.2	1.7	17.7	1.28
12	9 7.0	10 29 35.10	10 55 13.7	1.9	20.1	1.46	28	6 8.1	10 31 34.75	10 35 5.3	1.6	17.7	1.27
13	9 2.9	10 29 22.44	10 56 18.0	1.9	20.0	1.45	29	6 4.5	10 31 52.60	10 33 9.9	1.6	17.6	1.27
14	8 58.8	10 29 10.44	10 57 18.3	1.9	20.0	1.45	30	6 0.9	10 32 11.04	10 31 11.1	1.6	17.6	1.26
15	8 54.7	10 28 59.10	10 58 14.7	1.9	19.9	1.44	31	5 57.3	10 32 30.04	+10 29 9.0	1.6	17.6	1.26
16	8 50.6	10 28 48.42	+10 59 7.1	1.9	19.9	1.44	Dec. 1	19 54.6	12 37 29.21	− 2 44 9.5	1.4	15.9	1.14
17	8 46.5	10 28 38.40	10 59 55.3	1.9	19.8	1.43	2	19 51.2	12 38 3.06	2 47 33.8	1.4	16.0	1.15
18	8 42.4	10 28 29.05	11 0 39.3	1.9	19.8	1.43	3	19 47.8	12 38 36.50	2 50 55.4	1.5	16.0	1.15
19	8 38.3	10 28 20.38	11 1 19.2	1.9	19.7	1.43	4	19 44.4	12 39 9.54	2 54 14.1	1.5	16.1	1.15
20	8 34.2	10 28 12.41	11 1 55.0	1.9	19.7	1.42	5	19 41.0	12 39 42.17	2 57 29.8	1.5	16.1	1.15
21	8 30.2	10 28 5.13	+11 2 26.6	1.8	19.6	1.42	6	19 37.6	12 40 14.39	− 3 0 42.5	1.5	16.2	1.15
22	8 26.1	10 27 58.55	11 2 54.0	1.8	19.6	1.42	7	19 34.2	12 40 46.18	3 3 52.3	1.5	16.2	1.16
23	8 22.1	10 27 52.67	11 3 17.4	1.8	19.5	1.41	8	19 30.8	12 41 17.53	3 6 59.2	1.5	16.2	1.16
24	8 18.1	10 27 47.49	11 3 36.6	1.8	19.5	1.41	9	19 27.4	12 41 48.43	3 10 3.0	1.5	16.3	1.16
25	8 14.1	10 27 43.01	11 3 51.7	1.8	19.4	1.41	10	19 24.0	12 42 18.89	3 13 3.6	1.5	16.3	1.17
26	8 10.1	10 27 39.22	+11 4 2.7	1.8	19.4	1.41	11	19 20.6	12 42 48.89	− 3 16 1.0	1.5	16.4	1.17
27	8 6.1	10 27 36.12	11 4 9.5	1.8	19.3	1.40	12	19 17.1	12 43 18.42	3 18 55.3	1.5	16.4	1.17
28	8 2.1	10 27 33.72	11 4 12.2	1.8	19.3	1.40	13	19 13.7	12 43 47.48	3 21 46.4	1.5	16.5	1.17
29	7 58.2	10 27 32.03	11 4 10.8	1.8	19.2	1.39	14	19 10.2	12 44 16.06	3 24 34.2	1.5	16.5	1.17
30	7 54.2	10 27 31.04	11 4 5.3	1.8	19.2	1.39	15	19 6.8	12 44 44.16	3 27 18.7	1.5	16.6	1.18
May 1	7 50.3	10 27 30.73	+11 3 55.7	1.8	19.1	1.38	16	19 3.3	12 45 11.77	− 3 29 59.8	1.6	16.6	1.18
2	7 46.4	10 27 31.10	11 3 42.0	1.8	19.1	1.38	17	18 59.8	12 45 38.87	3 32 37.5	1.6	16.6	1.18
3	7 42.5	10 27 32.18	11 3 24.3	1.8	19.0	1.37	18	18 56.3	12 46 5.46	3 35 11.7	1.6	16.7	1.19
4	7 38.6	10 27 33.94	11 3 2.6	1.8	19.0	1.37	19	18 52.8	12 46 31.55	3 37 42.5	1.6	16.7	1.19
5	7 34.7	10 27 36.38	11 2 36.9	1.8	18.9	1.36	20	18 49.3	12 46 57.13	3 40 9.8	1.6	16.8	1.20
6	7 30.8	10 27 39.51	+11 2 7.2	1.8	18.9	1.36	21	18 45.8	12 47 22.18	− 3 42 33.5	1.6	16.8	1.20
7	7 26.9	10 27 43.31	11 1 33.5	1.7	18.8	1.36	22	18 42.3	12 47 46.69	3 44 53.7	1.6	16.9	1.20
8	7 23.0	10 27 47.79	11 0 55.8	1.7	18.7	1.35	23	18 38.8	12 48 10.67	3 47 10.4	1.6	16.9	1.21
9	7 19.1	10 27 52.94	11 0 14.1	1.7	18.7	1.35	24	18 35.2	12 48 34.11	3 49 23.5	1.6	17.0	1.21
10	7 15.3	10 27 58.76	10 59 28.5	1.7	18.6	1.34	25	18 31.7	12 48 57.01	3 51 32.9	1.6	17.0	1.22
11	7 11.5	10 28 5.28	+10 58 39.1	1.7	18.5	1.34	26	18 28.1	12 49 19.35	− 3 53 38.6	1.6	17.1	1.22
12	7 7.7	10 28 12.45	10 57 45.9	1.7	18.5	1.34	27	18 24.5	12 49 41.14	3 55 40.7	1.6	17.1	1.22
13	7 3.9	10 28 20.28	10 56 48.9	1.7	18.4	1.33	28	18 20.9	12 50 2.37	3 57 39.0	1.6	17.2	1.23
14	7 0.1	10 28 28.77	10 55 48.1	1.7	18.3	1.33	29	18 17.3	12 50 23.03	3 59 33.5	1.6	17.2	1.23
15	6 56.4	10 28 37.93	10 54 43.4	1.7	18.3	1.33	30	18 13.7	12 50 43.10	4 1 24.2	1.6	17.3	1.23
16	6 52.6	10 28 47.74	+10 53 34.9	1.7	18.2	1.32	31	18 10.1	12 51 2.58	− 4 3 11.1	1.6	17.3	1.23
17	6 48.9	10 28 58.19	+10 52 22.6	1.7	18.1	1.32	32	18 6.5	12 51 21.47	− 4 4 54.2	1.6	17.4	1.24

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi-diam.	Sid.T. of S.D. Pass. Mer.	Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi-diam.	Sid.T. of S.D. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	
July 1	18 46.4	1 25 57.46	+6 24 43.9	0.9	8.1	0.59	Aug. 16	15 49.0	1 29 25.87	+6 31 59.0	1.0	8.9	0.64
2	18 42.7	1 26 10.16	6 25 43.1	0.9	8.1	0.59	17	15 45.0	1 29 21.46	6 31 16.3	1.0	8.9	0.64
3	18 39.0	1 26 22.52	6 26 40.1	0.9	8.2	0.60	18	15 41.0	1 29 16.67	6 30 31.4	1.0	8.9	0.64
4	18 35.2	1 26 34.55	6 27 35.0	0.9	8.2	0.60	19	15 37.0	1 29 11.50	6 29 44.5	1.0	8.9	0.65
5	18 31.5	1 26 46.25	6 28 27.8	0.9	8.2	0.60	20	15 33.0	1 29 5.96	6 28 55.4	1.0	8.9	0.65
6	18 27.8	1 26 57.61	+6 29 18.5	0.9	8.2	0.60	21	15 29.0	1 29 0.05	+6 28 4.3	1.0	8.9	0.65
7	18 24.0	1 27 8.63	6 30 7.0	0.9	8.3	0.60	22	15 24.9	1 28 53.77	6 27 11.2	1.0	8.9	0.65
8	18 20.3	1 27 19.31	6 30 53.4	0.9	8.3	0.60	23	15 20.9	1 28 47.14	6 26 16.1	1.0	9.0	0.65
9	18 16.5	1 27 29.64	6 31 37.6	0.9	8.3	0.60	24	15 16.8	1 28 40.14	6 25 19.0	1.0	9.0	0.65
10	18 12.7	1 27 39.61	6 32 19.6	0.9	8.3	0.60	25	15 12.8	1 28 32.79	6 24 20.0	1.0	9.0	0.65
11	18 9.0	1 27 49.23	+6 32 59.4	0.9	8.3	0.61	26	15 8.7	1 28 25.09	+6 23 19.0	1.0	9.0	0.65
12	18 5.2	1 27 58.50	6 33 37.1	0.9	8.3	0.61	27	15 4.6	1 28 17.03	6 22 16.1	1.0	9.0	0.65
13	18 1.4	1 28 7.41	6 34 12.5	0.9	8.3	0.61	28	15 0.5	1 28 8.63	6 21 11.4	1.0	9.0	0.66
14	17 57.6	1 28 15.96	6 34 45.7	0.9	8.4	0.61	29	14 56.5	1 27 59.88	6 20 4.8	1.0	9.0	0.66
15	17 53.8	1 28 24.14	6 35 16.7	0.9	8.4	0.61	30	14 52.4	1 27 50.79	6 18 56.4	1.0	9.0	0.66
16	17 50.0	1 28 31.96	+6 35 45.4	0.9	8.4	0.61	31	14 48.3	1 27 41.37	+6 17 46.1	1.0	9.1	0.66
17	17 46.2	1 28 39.41	6 36 11.9	0.9	8.4	0.61	Sept. 1	14 44.2	1 27 31.62	6 16 34.1	1.0	9.1	0.66
18	17 42.4	1 28 46.49	6 36 36.1	0.9	8.4	0.61	2	14 40.1	1 27 21.55	6 15 20.4	1.0	9.1	0.66
19	17 38.6	1 28 53.19	6 36 58.1	1.0	8.5	0.62	3	14 36.0	1 27 11.15	6 14 5.0	1.0	9.1	0.66
20	17 34.8	1 28 59.52	6 37 17.8	1.0	8.5	0.62	4	14 31.9	1 27 0.43	6 12 47.9	1.0	9.1	0.66
21	17 30.9	1 29 5.47	+6 37 35.2	1.0	8.5	0.62	5	14 27.8	1 26 49.40	+6 11 29.2	1.0	9.1	0.66
22	17 27.1	1 29 11.04	6 37 50.4	1.0	8.5	0.62	6	14 23.7	1 26 38.06	6 10 8.9	1.0	9.1	0.66
23	17 23.2	1 29 16.24	6 38 3.3	1.0	8.5	0.62	7	14 19.5	1 26 26.41	6 8 47.0	1.0	9.1	0.66
24	17 19.3	1 29 21.06	6 38 14.0	1.0	8.5	0.62	8	14 15.4	1 26 14.46	6 7 23.4	1.0	9.2	0.66
25	17 15.5	1 29 25.50	6 38 22.4	1.0	8.5	0.62	9	14 11.3	1 26 2.21	6 5 58.3	1.0	9.2	0.66
26	17 11.7	1 29 29.56	+6 38 28.5	1.0	8.6	0.63	10	14 7.1	1 25 49.67	+6 4 31.8	1.0	9.2	0.66
27	17 7.8	1 29 33.24	6 38 32.4	1.0	8.6	0.63	11	14 3.0	1 25 36.85	6 3 3.9	1.0	9.2	0.66
28	17 3.9	1 29.36.53	6 38 33.9	1.0	8.6	0.63	12	13 58.8	1 25 23.76	6 1 34.6	1.0	9.2	0.66
29	17 0.1	1 29 39.44	6 38 33.2	1.0	8.6	0.63	13	13 54.7	1 25 10.41	6 0 3.9	1.0	9.2	0.66
30	16 56.1	1 29 41.97	6 38 30.3	1.0	8.6	0.63	14	13 50.5	1 24 56.79	5 58 31.9	1.0	9.2	0.66
31	16 52.2	1 29 44.12	+6 38 25.1	1.0	8.6	0.63	15	13 46.4	1 24 42.91	+5 56 58.6	1.0	9.2	0.66
Aug. 1	16 48.4	1 29 45.88	6 38 17.7	1.0	8.6	0.63	16	13 42.2	1 24 28.79	5 55 24.2	1.0	9.2	0.67
2	16 44.4	1 29 47.25	6 38 8.0	1.0	8.6	0.63	17	13 38.0	1 24 14.43	5 53 48.6	1.0	9.2	0.67
3	16 40.5	1 29 48.24	6 37 56.1	1.0	8.7	0.63	18	13 33.9	1 23 59.83	5 52 11.9	1.0	9.2	0.67
4	16 36.6	1 29 48.85	6 37 42.0	1.0	8.7	0.63	19	13 29.7	1 23 45.01	5 50 34.1	1.0	9.2	0.67
5	16 32.7	1 29 49.07	+6 37 25.7	1.0	8.7	0.63	20	13 25.5	1 23 29.98	+5 48 55.4	1.0	9.3	0.67
6	16 28.8	1 29 48.89	6 37 7.1	1.0	8.7	0.63	21	13 21.3	1 23 14.74	5 47 15.7	1.0	9.3	0.67
7	16 24.8	1 29 48.33	6 36 46.2	1.0	8.7	0.63	22	13 17.1	1 22 59.30	5 45 35.0	1.0	9.3	0.67
8	16 20.8	1 29 47.38	6 36 23.1	1.0	8.7	0.63	23	13 12.9	1 22 43.65	5 43 53.5	1.0	9.3	0.67
9	16 16.9	1 29 46.04	6 35 57.8	1.0	8.7	0.63	24	13 8.7	1 22 27.82	5 42 11.2	1.0	9.3	0.67
10	16 13.0	1 29 44.32	+6 35 30.3	1.0	8.8	0.63	25	13 4.5	1 22 11.82	+5 40 28.2	1.0	9.3	0.67
11	16 9.0	1 29 42.21	6 35 0.5	1.0	8.8	0.63	26	13 0.3	1 21 55.66	5 38 44.5	1.0	9.3	0.67
12	16 5.0	1 29 39.71	6 34 28.5	1.0	8.8	0.63	27	12 56.1	1 21 39.34	5 37 0.1	1.0	9.3	0.67
13	16 1.0	1 29 36.82	6 33 54.4	1.0	8.8	0.64	28	12 51.9	1 21 22.87	5 35 15.1	1.0	9.3	0.67
14	15 57.0	1 29 33.55	6 33 18.1	1.0	8.8	0.64	29	12 47.7	1 21 6.26	5 33 29.7	1.0	9.3	0.67
15	15 53.0	1 29 29.90	+6 32 39.6	1.0	8.8	0.64	30	12 43.5	1 20 49.51	+5 31 43.7	1.0	9.3	0.67
16	15 49.0	1 29 25.87	+6 31 59.0	1.0	8.9	0.64	Oct. 1	12 39.3	1 20 32.63	+5 29 57.2	1.1	9.3	0.67

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi-diam.	Sid. T. of S.D. Pass. Mer.	Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi-diam.	Sid. T. of S.D. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
Oct. 1	12 39.3	1 20 32.63	+5 29 57.2	1.1	9.3	0.67	Nov. 16	9 26.0	1 8 2.40	+4 17 2.3	1.0	9.2	0.65
2	12 35.1	1 20 15.64	5 28 10.4	1.1	9.3	0.67	17	9 21.8	1 7 50.09	4 15 59.0	1.0	9.2	0.65
3	12 30.9	1 19 58.54	5 26 23.3	1.1	9.3	0.67	18	9 17.7	1 7 38.08	4 14 57.7	1.0	9.2	0.65
4	12 26.6	1 19 41.33	5 24 35.9	1.1	9.3	0.67	19	9 13.6	1 7 26.37	4 13 58.6	1.0	9.1	0.65
5	12 22.4	1 19 24.03	5 22 48.2	1.1	9.3	0.67	20	9 9.5	1 7 14.98	4 13 1.7	1.0	9.1	0.65
6	12 18.2	1 19 6.65	+5 21 0.3	1.1	9.3	0.67	21	9 5.3	1 7 3.91	+4 12 7.0	1.0	9.1	0.65
7	12 14.0	1 18 49.20	5 19 12.4	1.1	9.3	0.67	22	9 1.2	1 6 53.16	4 11 14.5	1.0	9.1	0.65
8	12 9.8	1 18 31.68	5 17 24.4	1.1	9.3	0.67	23	8 57.1	1 6 42.73	4 10 24.2	1.0	9.1	0.65
9	12 5.6	1 18 14.11	5 15 36.4	1.1	9.3	0.67	24	8 53.0	1 6 32.64	4 9 36.2	1.0	9.1	0.65
10	12 1.3	1 17 56.49	5 13 48.5	1.1	9.3	0.67	25	8 48.9	1 6 22.89	4 8 50.5	1.0	9.1	0.65
11	11 57.1	1 17 38.84	+5 12 0.8	1.1	9.4	0.67	26	8 44.8	1 6 13.48	+4 8 7.2	1.0	9.1	0.65
12	11 52.9	1 17 21.17	5 10 13.2	1.1	9.4	0.67	27	8 40.8	1 6 4.41	4 7 26.1	1.0	9.0	0.65
13	11 48.6	1 17 3.49	5 8 25.9	1.1	9.4	0.67	28	8 36.7	1 5 55.69	4 6 47.4	1.0	9.0	0.65
14	11 44.4	1 16 45.81	5 6 39.0	1.1	9.4	0.67	29	8 32.6	1 5 47.33	4 6 11.1	1.0	9.0	0.65
15	11 40.2	1 16 28.13	5 4 52.5	1.1	9.4	0.67	30	8 28.5	1 5 39.33	4 5 37.2	1.0	9.0	0.65
16	11 36.0	1 16 10.46	+5 3 6.4	1.1	9.4	0.67	Dec. 1	8 24.5	1 5 31.69	+4 5 5.8	1.0	9.0	0.64
17	11 31.7	1 15 52.83	5 1 20.7	1.1	9.4	0.67	2	8 20.4	1 5 24.42	4 4 36.8	1.0	9.0	0.64
18	11 27.5	1 15 35.24	4 59 35.5	1.1	9.4	0.67	3	8 16.4	1 5 17.52	4 4 10.2	1.0	8.9	0.64
19	11 23.3	1 15 17.69	4 57 51.0	1.1	9.4	0.67	4	8 12.4	1 5 10.99	4 3 46.0	1.0	8.9	0.64
20	11 19.0	1 15 0.19	4 56 7.2	1.0	9.4	0.67	5	8 8.3	1 5 4.84	4 3 24.4	1.0	8.9	0.64
21	11 14.8	1 14 42.76	+4 54 24.2	1.0	9.4	0.67	6	8 4.3	1 4 59.07	+4 3 5.3	1.0	8.9	0.64
22	11 10.6	1 14 25.41	4 52 42.1	1.0	9.4	0.67	7	8 0.3	1 4 53.69	4 2 48.7	1.0	8.9	0.64
23	11 6.4	1 14 8.15	4 51 0.8	1.0	9.3	0.67	8	7 56.2	1 4 48.70	4 2 34.6	1.0	8.9	0.64
24	11 2.2	1 13 50.99	4 49 20.4	1.0	9.3	0.67	9	7 52.2	1 4 44.10	4 2 23.0	1.0	8.9	0.64
25	10 58.0	1 13 33.93	4 47 41.0	1.0	9.3	0.67	10	7 48.2	1 4 39.90	4 2 14.0	1.0	8.8	0.63
26	10 53.8	1 13 16.99	+4 46 2.7	1.0	9.3	0.67	11	7 44.3	1 4 36.10	+4 2 7.6	1.0	8.8	0.63
27	10 49.5	1 13 0.16	4 44 25.5	1.0	9.3	0.67	12	7 40.3	1 4 32.69	4 2 3.7	1.0	8.8	0.63
28	10 45.3	1 12 43.46	4 42 49.4	1.0	9.3	0.67	13	7 36.3	1 4 29.68	4 2 2.4	1.0	8.8	0.63
29	10 41.1	1 12 26.90	4 41 14.4	1.0	9.3	0.67	14	7 32.3	1 4 27.06	4 2 3.7	1.0	8.8	0.63
30	10 36.9	1 12 10.49	4 39 40.5	1.0	9.3	0.67	15	7 28.4	1 4 24.85	4 2 7.7	1.0	8.8	0.63
31	10 32.7	1 11 54.23	+4 38 7.9	1.0	9.3	0.66	16	7 24.4	1 4 23.05	+4 2 14.2	1.0	8.8	0.63
Nov. 1	10 28.5	1 11 38.14	4 36 36.7	1.0	9.3	0.66	17	7 20.4	1 4 21.66	4 2 23.3	1.0	8.8	0.63
2	10 24.3	1 11 22.23	4 35 7.0	1.0	9.3	0.66	18	7 16.5	1 4 20.68	4 2 35.0	1.0	8.7	0.63
3	10 20.1	1 11 6.50	4 33 38.7	1.0	9.3	0.66	19	7 12.5	1 4 20.10	4 2 49.3	1.0	8.7	0.63
4	10 15.9	1 10 50.96	4 32 11.8	1.0	9.3	0.66	20	7 8.6	1 4 19.92	4 3 6.1	1.0	8.7	0.63
5	10 11.7	1 10 35.63	+4 30 46.4	1.0	9.3	0.66	21	7 4.7	1 4 20.16	+4 3 25.6	1.0	8.7	0.63
6	10 7.6	1 10 20.50	4 29 22.6	1.0	9.3	0.66	22	7 0.8	1 4 20.81	4 3 47.6	1.0	8.7	0.62
7	10 3.4	1 10 5.57	4 28 0.5	1.0	9.3	0.66	23	6 56.8	1 4 21.86	4 4 12.1	1.0	8.7	0.62
8	9 59.2	1 9 50.86	4 26 40.1	1.0	9.3	0.66	24	6 52.9	1 4 23.31	4 4 39.2	1.0	8.7	0.62
9	9 55.1	1 9 36.40	4 25 21.4	1.0	9.2	0.66	25	6 49.0	1 4 25.18	4 5 8.8	1.0	8.6	0.62
10	9 50.9	1 9 22.19	+4 24 4.4	1.0	9.2	0.66	26	6 45.1	1 4 27.45	+4 5 40.9	1.0	8.6	0.62
11	9 46.7	1 9 8.23	4 22 49.2	1.0	9.2	0.66	27	6 41.3	1 4 30.13	4 6 15.5	1.0	8.6	0.62
12	9 42.6	1 8 54.52	4 21 35.9	1.0	9.2	0.66	28	6 37.4	1 4 33.21	4 6 52.6	1.0	8.6	0.62
13	9 38.4	1 8 41.08	4 20 24.6	1.0	9.2	0.66	29	6 33.5	1 4 36.69	4 7 32.2	1.0	8.6	0.61
14	9 34.3	1 8 27.91	4 19 15.2	1.0	9.2	0.66	30	6 29.6	1 4 40.57	4 8 14.3	1.0	8.6	0.61
15	9 30.1	1 8 15.01	+4 18 7.7	1.0	9.2	0.66	31	6 25.8	1 4 44.86	+4 8 59.0	1.0	8.5	0.61
16	9 26.0	1 8 2.40	+4 17 2.3	1.0	9.2	0.65	32	6 21.9	1 4 49.55	+4 9 46.2	1.0	8.5	0.61

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi-diam.	Sid.T. of S.D. Pass. Mer.	Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi-diam.	Sid.T. of S.D. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
Apr. 8	18 22.7	19 30 57.57	−22 14 52.1	0.5	1.7	0.12	May 24	15 20.8	19 29 58.63	−22 18 20.0	0.5	1.8	0.13
9	18 18.8	19 31 1.03	22 14 46.4	0.5	1.7	0.12	25	15 16.8	19 29 52.73	22 18 34.1	0.5	1.8	0.13
10	18 14.9	19 31 4.28	22 14 41.2	0.5	1.7	0.12	26	15 12.8	19 29 46.65	22 18 48.6	0.5	1.8	0.13
11	18 11.0	19 31 7.32	22 14 36.5	0.5	1.7	0.12	27	15 8.7	19 29 40.40	22 19 3.4	0.5	1.8	0.13
12	18 7.2	19 31 10.15	22 14 32.2	0.5	1.7	0.12	28	15 4.7	19 29 33.99	22 19 18.5	0.5	1.8	0.13
13	18 3.3	19 31 12.77	−22 14 28.4	0.5	1.7	0.12	29	15 0.6	19 29 27.42	−22 19 33.9	0.5	1.8	0.13
14	17 59.4	19 31 15.17	22 14 25.1	0.5	1.7	0.12	30	14 56.6	19 29 20.70	22 19 49.7	0.5	1.8	0.13
15	17 55.5	19 31 17.35	22 14 22.2	0.5	1.7	0.12	31	14 52.6	19 29 13.82	22 20 5.8	0.5	1.8	0.13
16	17 51.6	19 31 19.30	22 14 19.8	0.5	1.7	0.12	June 1	14 48.5	19 29 6.79	22 20 22.1	0.5	1.8	0.13
17	17 47.7	19 31 21.04	22 14 17.8	0.5	1.7	0.12	2	14 44.5	19 28 59.61	22 20 38.7	0.5	1.8	0.13
18	17 43.7	19 31 22.57	−22 14 16.3	0.5	1.7	0.12	3	14 40.4	19 28 52.28	−22 20 55.6	0.5	1.8	0.13
19	17 39.8	19 31 23.88	22 14 15.3	0.5	1.7	0.12	4	14 36.3	19 28 44.81	22 21 12.8	0.5	1.8	0.13
20	17 35.9	19 31 24.98	22 14 14.8	0.5	1.7	0.12	5	14 32.3	19 28 37.20	22 21 30.2	0.5	1.8	0.13
21	17 32.0	19 31 25.86	22 14 14.7	0.5	1.7	0.12	6	14 28.2	19 28 29.45	22 21 47.8	0.5	1.8	0.13
22	17 28.1	19 31 26.52	22 14 15.1	0.5	1.7	0.12	7	14 24.2	19 28 21.56	22 22 5.7	0.5	1.8	0.13
23	17 24.2	19 31 26.96	−22 14 16.0	0.5	1.7	0.12	8	14 20.1	19 28 13.53	−22 22 23.9	0.5	1.8	0.13
24	17 20.2	19 31 27.18	22 14 17.3	0.5	1.7	0.12	9	14 16.0	19 28 5.38	22 22 42.3	0.5	1.8	0.13
25	17 16.3	19 31 27.19	22 14 19.1	0.5	1.7	0.12	10	14 12.0	19 27 57.11	22 23 0.9	0.5	1.8	0.13
26	17 12.4	19 31 26.99	22 14 21.4	0.5	1.7	0.12	11	14 7.9	19 27 48.71	22 23 19.7	0.5	1.8	0.13
27	17 8.5	19 31 26.57	22 14 24.2	0.5	1.7	0.13	12	14 3.8	19 27 40.18	22 23 38.6	0.5	1.8	0.13
28	17 4.5	19 31 25.94	−22 14 27.3	0.5	1.7	0.13	13	13 59.8	19 27 31.54	−22 23 57.7	0.5	1.8	0.13
29	17 0.6	19 31 25.10	22 14 30.9	0.5	1.7	0.13	14	13 55.7	19 27 22.79	22 24 17.1	0.5	1.8	0.13
30	16 56.6	19 31 24.05	22 14 35.0	0.5	1.7	0.13	15	13 51.6	19 27 13.93	22 24 36.7	0.5	1.8	0.13
May 1	16 52.7	19 31 22.79	22 14 39.5	0.5	1.7	0.13	16	13 47.5	19 27 4.96	22 24 56.4	0.5	1.8	0.13
2	16 48.7	19 31 21.32	22 14 44.5	0.5	1.7	0.13	17	13 43.4	19 26 55.89	22 25 16.3	0.5	1.8	0.13
3	16 44.8	19 31 19.64	−22 14 49.9	0.5	1.7	0.13	18	13 39.3	19 26 46.72	−22 25 36.3	0.5	1.8	0.13
4	16 40.8	19 31 17.76	22 14 55.7	0.5	1.7	0.13	19	13 35.3	19 26 37.46	22 25 56.5	0.5	1.8	0.13
5	16 36.8	19 31 15.68	22 15 2.0	0.5	1.7	0.13	20	13 31.2	19 26 28.11	22 26 16.7	0.5	1.8	0.13
6	16 32.9	19 31 13.40	22 15 8.8	0.5	1.7	0.13	21	13 27.1	19 26 18.67	22 26 37.1	0.5	1.8	0.13
7	16 28.9	19 31 10.92	22 15 16.0	0.5	1.8	0.13	22	13 23.0	19 26 9.14	22 26 57.6	0.5	1.8	0.13
8	16 24.9	19 31 8.23	−22 15 23.5	0.5	1.8	0.13	23	13 18.9	19 25 59.54	−22 27 18.2	0.5	1.8	0.13
9	16 20.9	19 31 5.33	22 15 31.5	0.5	1.8	0.13	24	13 14.8	19 25 49.88	22 27 38.9	0.5	1.8	0.13
10	16 16.9	19 31 2.23	22 15 39.9	0.5	1.8	0.13	25	13 10.7	19 25 40.14	22 27 59.7	0.5	1.8	0.13
11	16 12.9	19 30 58.93	22 15 48.8	0.5	1.8	0.13	26	13 6.6	19 25 30.33	22 28 20.5	0.5	1.8	0.13
12	16 8.9	19 30 55.43	22 15 58.0	0.5	1.8	0.13	27	13 2.5	19 25 20.45	22 28 41.4	0.5	1.8	0.13
13	16 5.0	19 30 51.74	−22 16 7.7	0.5	1.8	0.13	28	12 58.4	19 25 10.52	−22 29 2.4	0.5	1.8	0.13
14	16 1.0	19 30 47.85	22 16 17.8	0.5	1.8	0.13	29	12 54.3	19 25 0.53	22 29 23.4	0.5	1.8	0.13
15	15 57.0	19 30 43.76	22 16 28.4	0.5	1.8	0.13	30	12 50.2	19 24 50.50	22 29 44.4	0.5	1.8	0.13
16	15 53.0	19 30 39.48	22 16 39.3	0.5	1.8	0.13	July 1	12 46.1	19 24 40.42	22 30 5.5	0.5	1.8	0.13
17	15 49.0	19 30 35.02	22 16 50.6	0.5	1.8	0.13	2	12 42.0	19 24 30.29	22 30 26.6	0.5	1.8	0.13
18	15 45.0	19 30 30.37	−22 17 2.3	0.5	1.8	0.13	3	12 37.9	19 24 20.13	−22 30 47.7	0.5	1.8	0.13
19	15 40.9	19 30 25.53	22 17 14.3	0.5	1.8	0.13	4	12 33.8	19 24 9.94	22 31 8.8	0.5	1.8	0.13
20	15 36.9	19 30 20.51	22 17 26.8	0.5	1.8	0.13	5	12 29.7	19 23 59.71	22 31 29.9	0.5	1.8	0.13
21	15 32.9	19 30 15.31	22 17 39.6	0.5	1.8	0.13	6	12 25.6	19 23 49.45	22 31 51.0	0.5	1.8	0.13
22	15 28.9	19 30 9.92	22 17 52.7	0.5	1.8	0.13	7	12 21.5	19 23 39.18	22 32 12.0	0.5	1.8	0.13
23	15 24.9	19 30 4.36	−22 18 6.2	0.5	1.8	0.13	8	12 17.4	19 23 28.89	−22 32 33.1	0.5	1.8	0.13
24	15 20.8	19 29 58.63	−22 18 20.0	0.5	1.8	0.13	9	12 13.3	19 23 18.57	−22 32 54.1	0.5	1.8	0.13

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi-diam.	Sid. T. of S.D. Pass. Mer.	Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi-diam.	Sid. T. of S.D. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
July 9	12 13.3	19 23 18.57	−22 32 54.1	0.5	1.8	0.13	Aug. 23	9 9.6	19 16 27.20	−22 45 53.4	0.5	1.8	0.13
10	12 9.2	19 23 8.24	22 33 15.0	0.5	1.8	0.13	24	9 5.5	19 16 20.61	22 46 4.8	0.5	1.8	0.13
11	12 5.1	19 22 57.91	22 33 35.9	0.5	1.8	0.13	25	9 1.5	19 16 14.19	22 46 15.9	0.5	1.8	0.13
12	12 1.0	19 22 47.58	22 33 56.7	0.5	1.8	0.13	26	8 57.4	19 16 7.94	22 46 26.6	0.5	1.8	0.13
13	11 56.9	19 22 37.26	22 34 17.4	0.5	1.8	0.13	27	8 53.4	19 16 1.86	22 46 37.0	0.5	1.8	0.13
14	11 52.8	19 22 26.94	−22 34 38.1	0.5	1.8	0.13	28	8 49.4	19 15 55.94	−22 46 47.0	0.5	1.8	0.13
15	11 48.7	19 22 16.64	22 34 58.7	0.5	1.8	0.13	29	8 45.3	19 15 50.19	22 46 56.7	0.5	1.8	0.13
16	11 44.6	19 22 6.35	22 35 19.2	0.5	1.8	0.13	30	8 41.3	19 15 44.62	22 47 6.1	0.5	1.8	0.13
17	11 40.5	19 21 56.07	22 35 39.5	0.5	1.8	0.13	31	8 37.3	19 15 39.23	22 47 15.1	0.5	1.8	0.13
18	11 36.4	19 21 45.81	22 35 59.7	0.5	1.8	0.13	Sept. 1	8 33.3	19 15 34.01	22 47 23.7	0.5	1.8	0.13
19	11 32.2	19 21 35.59	−22 36 19.8	0.5	1.8	0.13	2	8 29.3	19 15 28.98	−22 47 32.0	0.5	1.8	0.13
20	11 28.2	19 21 25.41	22 36 39.8	0.5	1.8	0.13	3	8 25.3	19 15 24.13	22 47 40.0	0.5	1.8	0.13
21	11 24.1	19 21 15.27	22 36 59.6	0.5	1.8	0.13	4	8 21.3	19 15 19.47	22 47 47.6	0.5	1.8	0.13
22	11 20.0	19 21 5.16	22 37 19.4	0.5	1.8	0.13	5	8 17.3	19 15 15.00	22 47 54.8	0.5	1.8	0.13
23	11 15.9	19 20 55.10	22 37 39.0	0.5	1.8	0.13	6	8 13.3	19 15 10.72	22 48 1.7	0.5	1.8	0.13
24	11 11.8	19 20 45.09	−22 37 58.4	0.5	1.8	0.13	7	8 9.3	19 15 6.63	−22 48 8.2	0.5	1.8	0.13
25	11 7.7	19 20 35.13	22 38 17.6	0.5	1.8	0.13	8	8 5.3	19 15 2.73	22 48 14.3	0.5	1.8	0.13
26	11 3.6	19 20 25.24	22 38 36.6	0.5	1.8	0.13	9	8 1.3	19 14 59.03	22 48 20.0	0.5	1.8	0.13
27	10 59.5	19 20 15.42	22 38 55.5	0.5	1.8	0.13	10	7 57.3	19 14 55.53	22 48 25.4	0.5	1.8	0.13
28	10 55.4	19 20 5.66	22 39 14.2	0.5	1.8	0.13	11	7 53.3	19 14 52.24	22 48 30.4	0.5	1.8	0.13
29	10 51.3	19 19 55.95	−22 39 32.6	0.5	1.8	0.13	12	7 49.3	19 14 49.15	−22 48 35.1	0.5	1.8	0.13
30	10 47.2	19 19 46.33	22 39 50.8	0.5	1.8	0.13	13	7 45.3	19 14 46.26	22 48 39.4	0.5	1.8	0.13
31	10 43.1	19 19 36.79	22 40 8.8	0.5	1.8	0.13	14	7 41.3	19 14 43.58	22 48 43.3	0.5	1.8	0.13
Aug. 1	10 39.0	19 19 27.33	22 40 26.7	0.5	1.8	0.13	15	7 37.4	19 14 41.10	22 48 46.8	0.5	1.7	0.13
2	10 35.0	19 19 17.95	22 40 44.4	0.5	1.8	0.13	16	7 33.4	19 14 38.84	22 48 49.9	0.5	1.7	0.13
3	10 30.9	19 19 8.65	−22 41 1.7	0.5	1.8	0.13	17	7 29.4	19 14 36.79	−22 48 52.6	0.5	1.7	0.13
4	10 26.8	19 18 59.45	22 41 18.8	0.5	1.8	0.13	18	7 25.5	19 14 34.94	22 48 55.0	0.5	1.7	0.13
5	10 22.7	19 18 50.36	22 41 35.7	0.5	1.8	0.13	19	7 21.5	19 14 33.30	22 48 57.0	0.5	1.7	0.13
6	10 18.6	19 18 41.37	22 41 52.5	0.5	1.8	0.13	20	7 17.6	19 14 31.88	22 48 58.6	0.5	1.7	0.13
7	10 14.5	19 18 32.48	22 42 9.0	0.5	1.8	0.13	21	7 13.6	19 14 30.68	22 48 59.8	0.5	1.7	0.13
8	10 10.5	19 18 23.69	−22 42 25.2	0.5	1.8	0.13	22	7 9.6	19 14 29.69	−22 49 0.6	0.5	1.7	0.13
9	10 6.4	19 18 15.01	22 42 41.1	0.5	1.8	0.13	23	7 5.7	19 14 28.91	22 49 1.1	0.5	1.7	0.13
10	10 2.3	19 18 6.45	22 42 56.7	0.5	1.8	0.13	24	7 1.8	19 14 28.36	22 49 1.1	0.5	1.7	0.13
11	9 58.2	19 17 58.01	22 43 12.0	0.5	1.8	0.13	25	6 57.8	19 14 28.02	22 49 0.7	0.5	1.7	0.13
12	9 54.2	19 17 49.69	22 43 27.1	0.5	1.8	0.13	26	6 53.9	19 14 27.89	22 49 0.0	0.5	1.7	0.13
13	9 50.1	19 17 41.49	−22 43 41.9	0.5	1.8	0.13	27	6 50.0	19 14 27.97	−22 48 58.9	0.5	1.7	0.13
14	9 46.0	19 17 33.42	22 43 56.4	0.5	1.8	0.13	28	6 46.0	19 14 28.27	22 48 57.3	0.5	1.7	0.13
15	9 42.0	19 17 25.48	22 44 10.5	0.5	1.8	0.13	29	6 42.1	19 14 28.79	22 48 55.4	0.5	1.7	0.13
16	9 37.9	19 17 17.68	22 44 24.4	0.5	1.8	0.13	30	6 38.2	19 14 29.53	22 48 53.1	0.5	1.7	0.13
17	9 33.9	19 17 10.02	22 44 38.1	0.5	1.8	0.13	Oct. 1	6 34.3	19 14 30.49	22 48 50.3	0.5	1.7	0.13
18	9 29.8	19 17 2.51	−22 44 51.5	0.5	1.8	0.13	2	6 30.4	19 14 31.67	−22 48 47.2	0.5	1.7	0.13
19	9 25.7	19 16 55.15	22 45 4.5	0.5	1.8	0.13	3	6 26.5	19 14 33.07	22 48 43.7	0.5	1.7	0.13
20	9 21.7	19 16 47.94	22 45 17.2	0.5	1.8	0.13	4	6 22.6	19 14 34.68	22 48 39.9	0.5	1.7	0.13
21	9 17.6	19 16 40.88	22 45 29.6	0.5	1.8	0.13	5	6 18.7	19 14 36.51	22 48 35.7	0.5	1.7	0.13
22	9 13.6	19 16 33.96	22 45 41.7	0.5	1.8	0.13	6	6 14.8	19 14 38.56	22 48 31.0	0.5	1.7	0.13
23	9 9.6	19 16 27.20	−22 45 53.4	0.5	1.8	0.13	7	6 10.9	19 14 40.83	−22 48 25.9	0.5	1.7	0.13
24	9 5.5	19 16 20.61	−22 46 4.8	0.5	1.8	0.13	8	6 7.0	19 14 43.32	−22 48 20.4	0.5	1.7	0.13

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi-diam.	Sid.T. of S.D. Pass. Mer.	Date.	Mean Time of Transit	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi-diam.	Sid.T. of S.D. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
Jan. 0	12 27.5	7 8 28.94	+21 43 56.8	0.3	1.3	0.10	Feb. 14	9 25.7	7 3 32.34	+21 52 38.1	0.3	1.3	0.09
1	12 23.5	7 8 21.74	21 44 9.2	0.3	1.3	0.10	15	9 21.7	7 3 27.30	21 52 47.5	0.3	1.3	0.09
2	12 19.4	7 8 14.52	21 44 21.6	0.3	1.3	0.10	16	9 17.6	7 3 22.38	21 52 56.8	0.3	1.3	0.09
3	12 15.4	7 8 7.29	21 44 34.1	0.3	1.3	0.10	17	9 13.6	7 3 17.57	21 53 5.9	0.3	1.3	0.09
4	12 11.3	7 8 0.06	21 44 46.5	0.3	1.3	0.10	18	9 9.6	7 3 12.87	21 53 14.8	0.3	1.3	0.09
5	12 7.2	7 7 52.83	+21 44 58.9	0.3	1.3	0.10	19	9 5.6	7 3 8.28	+21 53 23.5	0.3	1.3	0.09
6	12 3.2	7 7 45.59	21 45 11.3	0.3	1.3	0.10	20	9 1.6	7 3 3.81	21 53 32.1	0.3	1.3	0.09
7	11 59.2	7 7 38.35	21 45 23.7	0.3	1.3	0.10	21	8 57.6	7 2 59.45	21 53 40.5	0.3	1.3	0.09
8	11 55.1	7 7 31.12	21 45 36.1	0.3	1.3	0.10	22	8 53.6	7 2 55.20	21 53 48.7	0.3	1.3	0.09
9	11 51.1	7 7 23.90	21 45 48.5	0.3	1.3	0.10	23	8 49.6	7 2 51.06	21 53 56.8	0.3	1.3	0.09
10	11 47.0	7 7 16.68	+21 46 0.9	0.3	1.3	0.10	24	8 45.6	7 2 47.05	+21 54 4.7	0.3	1.3	0.09
11	11 43.0	7 7 9.48	21 46 13.3	0.3	1.3	0.10	25	8 41.6	7 2 43.16	21 54 12.5	0.3	1.3	0.09
12	11 38.9	7 7 2.30	21 46 25.7	0.3	1.3	0.10	26	8 37.6	7 2 39.40	21 54 20.1	0.3	1.3	0.09
13	11 34.9	7 6 55.13	21 46 38.1	0.3	1.3	0.10	27	8 33.6	7 2 35.76	21 54 27.5	0.3	1.3	0.09
14	11 30.8	7 6 47.98	21 46 50.5	0.3	1.3	0.10	28	8 29.6	7 2 32.25	21 54 34.7	0.3	1.3	0.09
15	11 26.8	7 6 40.85	+21 47 2.8	0.3	1.3	0.10	Mar. 1	8 25.7	7 2 28.87	+21 54 41.7	0.3	1.3	0.09
16	11 22.7	7 6 33.75	21 47 15.1	0.3	1.3	0.10	2	8 21.7	7 2 25.61	21 54 48.5	0.3	1.3	0.09
17	11 18.7	7 6 26.69	21 47 27.4	0.3	1.3	0.10	3	8 17.7	7 2 22.48	21 54 55.2	0.3	1.3	0.09
18	11 14.6	7 6 19.66	21 47 39.7	0.3	1.3	0.10	4	8 13.7	7 2 19.48	21 55 1.7	0.3	1.3	0.09
19	11 10.6	7 6 12.66	21 47 51.9	0.3	1.3	0.10	5	8 9.7	7 2 16.61	21 55 8.0	0.3	1.3	0.09
20	11 6.5	7 6 5.70	+21 48 4.0	0.3	1.3	0.10	6	8 5.8	7 2 13.87	+21 55 14.2	0.3	1.3	0.09
21	11 2.4	7 5 58.78	21 48 16.1	0.3	1.3	0.10	7	8 1.8	7 2 11.27	21 55 20.1	0.3	1.3	0.09
22	10 58.4	7 5 51.90	21 48 28.1	0.3	1.3	0.10	8	7 57.8	7 2 8.80	21 55 25.8	0.3	1.3	0.09
23	10 54.4	7 5 45.08	21 48 40.0	0.3	1.3	0.10	9	7 53.8	7 2 6.46	21 55 31.3	0.3	1.3	0.09
24	10 50.3	7 5 38.32	21 48 51.8	0.3	1.3	0.10	10	7 49.9	7 2 4.26	21 55 36.7	0.3	1.3	0.09
25	10 46.3	7 5 31.60	+21 49 3.6	0.3	1.3	0.10	11	7 45.9	7 2 2.20	+21 55 41.9	0.3	1.3	0.09
26	10 42.3	7 5 24.93	21 49 15.3	0.3	1.3	0.10	12	7 41.9	7 2 0.27	21 55 46.9	0.3	1.3	0.09
27	10 38.2	7 5 18.33	21 49 26.9	0.3	1.3	0.10	13	7 37.9	7 1 58.48	21 55 51.7	0.3	1.3	0.09
28	10 34.2	7 5 11.80	21 49 38.4	0.3	1.3	0.10	14	7 34.0	7 1 56.83	21 55 56.3	0.3	1.3	0.09
29	10 30.1	7 5 5.32	21 49 49.9	0.3	1.3	0.10	15	7 30.1	7 1 55.32	21 56 0.5	0.3	1.3	0.09
30	10 26.1	7 4 58.90	+21 50 1.3	0.3	1.3	0.10	16	7 26.1	7 1 53.96	+21 56 4.5	0.3	1.3	0.09
31	10 22.1	7 4 52.55	21 50 12.6	0.3	1.3	0.10	17	7 22.2	7 1 52.74	21 56 8.4	0.3	1.3	0.09
Feb. 1	10 18.0	7 4 46.28	21 50 23.8	0.3	1.3	0.10	18	7 18.3	7 1 51.65	21 56 12.1	0.3	1.3	0.09
2	10 14.0	7 4 40.08	21 50 34.8	0.3	1.3	0.10	19	7 14.3	7 1 50.71	21 56 15.7	0.3	1.3	0.09
3	10 10.0	7 4 33.96	21 50 45.7	0.3	1.3	0.10	20	7 10.3	7 1 49.91	21 56 19.0	0.3	1.3	0.09
4	10 5.9	7 4 27.92	+21 50 56.5	0.3	1.3	0.09	21	7 6.4	7 1 49.26	+21 56 22.1	0.3	1.3	0.09
5	10 1.9	7 4 21.97	21 51 7.2	0.3	1.3	0.09	22	7 2.4	7 1 48.75	21 56 25.0	0.3	1.3	0.09
6	9 57.9	7 4 16.10	21 51 17.8	0.3	1.3	0.09	23	6 58.5	7 1 48.39	21 56 27.7	0.3	1.3	0.09
7	9 53.8	7 4 10.32	21 51 28.3	0.3	1.3	0.09	24	6 54.5	7 1 48.18	21 56 30.2	0.3	1.3	0.09
8	9 49.8	7 4 4.62	21 51 38.7	0.3	1.3	0.09	25	6 50.6	7 1 48.11	21 56 32.5	0.3	1.3	0.09
9	9 45.8	7 3 59.01	+21 51 48.9	0.3	1.3	0.09	26	6 46.7	7 1 48.19	+21 56 34.5	0.3	1.3	0.09
10	9 41.8	7 3 53.49	21 51 59.0	0.3	1.3	0.09	27	6 42.8	7 1 48.41	21 56 36.3	0.3	1.3	0.09
11	9 37.7	7 3 48.06	21 52 9.0	0.3	1.3	0.09	28	6 38.8	7 1 48.78	21 56 37.9	0.3	1.3	0.09
12	9 33.7	7 3 42.72	21 52 18.9	0.3	1.3	0.09	29	6 34.9	7 1 49.28	21 56 39.3	0.3	1.3	0.09
13	9 29.7	7 3 37.48	21 52 28.6	0.3	1.3	0.09	30	6 31.0	7 1 49.92	21 56 40.5	0.3	1.3	0.09
14	9 25.7	7 3 32.34	+21 52 38.1	0.3	1.3	0.09	31	6 27.1	7 1 50.71	+21 56 41.5	0.3	1.3	0.09
15	9 21.7	7 3 27.30	+21 52 47.5	0.3	1.3	0.09	Apr. 1	6 23.1	7 1 51.65	+21 56 42.2	0.3	1.3	0.09

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi-diam.	Sid. T. of S.D. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s
Apr. 1	6 23.1	7 1 51.65	+21 56 42.2	0.3	1.3	0.09
2	6 19.2	7 1 52.73	21 56 42.7	0.3	1.3	0.09
3	6 15.3	7 1 53.96	21 56 43.0	0.3	1.3	0.09
4	6 11.4	7 1 55.32	21 56 43.2	0.3	1.3	0.09
5	6 7.4	7 1 56.83	21 56 43.1	0.3	1.3	0.09
6	6 3.5	7 1 58.48	+21 56 42.8	0.3	1.3	0.09
7	5 59.6	7 2 0.27	21 56 42.3	0.3	1.3	0.09
8	5 55.7	7 2 2.20	21 56 41.6	0.3	1.3	0.09
9	5 51.8	7 2 4.27	21 56 40.9	0.3	1.3	0.09
10	5 47.9	7 2 6.49	21 56 40.0	0.3	1.3	0.09
Oct. 11	18 1.6	7 23 12.26	+21 21 41.5	0.3	1.3	0.09
12	17 57.7	7 23 13.72	21 21 37.7	0.3	1.3	0.09
13	17 53.8	7 23 15.05	21 21 34.3	0.3	1.3	0.09
14	17 49.9	7 23 16.22	21 21 31.1	0.3	1.3	0.09
15	17 46.0	7 23 17.26	21 21 28.1	0.3	1.3	0.09
16	17 42.1	7 23 18.16	+21 21 25.6	0.3	1.3	0.09
17	17 38.2	7 23 18.91	21 21 23.3	0.3	1.3	0.09
18	17 34.2	7 23 19.52	21 21 21.2	0.3	1.3	0.09
19	17 30.3	7 23 19.97	21 21 19.4	0.3	1.3	0.09
20	17 26.4	7 23 20.29	21 21 17.9	0.3	1.3	0.09
21	17 22.5	7 23 20.46	+21 21 16.8	0.3	1.3	0.09
22	17 18.5	7 23 20.48	21 21 15.9	0.3	1.3	0.09
23	17 14.6	7 23 20.36	21 21 15.3	0.3	1.3	0.09
24	17 10.7	7 23 20.10	21 21 15.0	0.3	1.3	0.09
25	17 6.7	7 23 19.70	21 21 15.0	0.3	1.3	0.09
26	17 2.8	7 23 19.15	+21 21 15.2	0.3	1.3	0.09
27	16 58.8	7 23 18.45	21 21 15.8	0.3	1.3	0.09
28	16 54.9	7 23 17.63	21 21 16.6	0.3	1.3	0.09
29	16 50.9	7 23 16.65	21 21 17.6	0.3	1.3	0.09
30	16 47.0	7 23 15.53	21 21 19.1	0.3	1.3	0.09
31	16 43.0	7 23 14.29	+21 21 20.8	0.3	1.3	0.09
Nov. 1	16 39.1	7 23 12.92	21 21 22.8	0.3	1.3	0.09
2	16 35.1	7 23 11.38	21 21 25.1	0.3	1.3	0.09
3	16 31.2	7 23 9.70	21 21 27.7	0.3	1.3	0.09
4	16 27.2	7 23 7.88	21 21 30.5	0.3	1.3	0.09
5	16 23.3	7 23 5.93	+21 21 33.6	0.3	1.3	0.09
6	16 19.3	7 23 3.84	21 21 37.0	0.3	1.3	0.09
7	16 15.3	7 23 1.61	21 21 40.7	0.3	1.3	0.09
8	16 11.3	7 22 59.25	21 21 44.7	0.3	1.3	0.09
9	16 7.4	7 22 56.76	21 21 49.0	0.3	1.3	0.09
10	16 3.4	7 22 54.13	+21 21 53.6	0.3	1.3	0.09
11	15 59.5	7 22 51.36	21 21 58.4	0.3	1.3	0.09
12	15 55.5	7 22 48.46	21 22 3.4	0.3	1.3	0.09
13	15 51.5	7 22 45.43	21 22 8.7	0.3	1.3	0.09
14	15 47.5	7 22 42.27	21 22 14.3	0.3	1.3	0.09
15	15 43.5	7 22 38.98	+21 22 20.2	0.3	1.3	0.09
16	15 39.5	7 22 35.57	+21 22 26.3	0.3	1.3	0.09
Nov. 16	15 39.5	7 22 35.57	+21 22 26.3	0.3	1.3	0.09
17	15 35.5	7 22 32.03	21 22 32.7	0.3	1.3	0.09
18	15 31.5	7 22 28.37	21 22 39.4	0.3	1.3	0.09
19	15 27.5	7 22 24.58	21 22 46.3	0.3	1.3	0.09
20	15 23.5	7 22 20.67	21 22 53.4	0.3	1.3	0.09
21	15 19.5	7 22 16.64	+21 23 0.8	0.3	1.3	0.09
22	15 15.5	7 22 12.50	21 23 8.5	0.3	1.3	0.09
23	15 11.5	7 22 8.24	21 23 16.4	0.3	1.3	0.09
24	15 7.5	7 22 3.86	21 23 24.6	0.3	1.3	0.09
25	15 3.5	7 21 59.37	21 23 33.0	0.3	1.3	0.09
26	14 59.5	7 21 54.77	+21 23 41.6	0.3	1.3	0.09
27	14 55.5	7 21 50.06	21 23 50.4	0.3	1.3	0.09
28	14 51.5	7 21 45.24	21 23 59.4	0.3	1.3	0.09
29	14 47.5	7 21 40.32	21 24 8.7	0.3	1.3	0.09
30	14 43.4	7 21 35.29	21 24 18.2	0.3	1.3	0.09
Dec. 1	14 39.4	7 21 30.15	+21 24 27.9	0.3	1.3	0.09
2	14 35.4	7 21 24.91	21 24 37.9	0.3	1.3	0.09
3	14 31.4	7 21 19.58	21 24 48.0	0.3	1.3	0.09
4	14 27.4	7 21 14.16	21 24 58.3	0.3	1.3	0.09
5	14 23.3	7 21 8.63	21 25 8.7	0.3	1.3	0.09
6	14 19.3	7 21 3.01	+21 25 19.3	0.3	1.3	0.09
7	14 15.3	7 20 57.30	21 25 30.2	0.3	1.3	0.09
8	14 11.2	7 20 51.50	21 25 41.3	0.3	1.3	0.09
9	14 7.2	7 20 45.62	21 25 52.5	0.3	1.3	0.09
10	14 3.2	7 20 39.66	21 26 3.9	0.3	1.3	0.09
11	13 59.2	7 20 33.62	+21 26 15.5	0.3	1.3	0.09
12	13 55.1	7 20 27.50	21 26 27.3	0.3	1.3	0.09
13	13 51.1	7 20 21.30	21 26 39.2	0.3	1.3	0.09
14	13 47.1	7 20 15.03	21 26 51.2	0.3	1.3	0.09
15	13 43.0	7 20 8.68	21 27 3.3	0.3	1.3	0.09
16	13 39.0	7 20 2.26	+21 27 15.6	0.3	1.3	0.09
17	13 34.9	7 19 55.78	21 27 28.0	0.3	1.3	0.09
18	13 30.9	7 19 49.25	21 27 40.6	0.3	1.3	0.09
19	13 26.9	7 19 42.66	21 27 53.4	0.3	1.3	0.09
20	13 22.8	7 19 36.01	21 28 6.3	0.3	1.3	0.09
21	13 18.8	7 19 29.30	+21 28 19.3	0.3	1.3	0.10
22	13 14.7	7 19 22.54	21 28 32.4	0.3	1.3	0.10
23	13 10.7	7 19 15.73	21 28 45.5	0.3	1.3	0.10
24	13 6.6	7 19 8.88	21 28 58.7	0.3	1.3	0.10
25	13 2.6	7 19 1.99	21 29 12.0	0.3	1.3	0.10
26	12 58.5	7 18 55.06	+21 29 25.4	0.3	1.3	0.10
27	12 54.5	7 18 48.08	21 29 38.9	0.3	1.3	0.10
28	12 50.4	7 18 41.06	21 29 52.5	0.3	1.3	0.10
29	12 46.4	7 18 34.02	21 30 6.2	0.3	1.3	0.10
30	12 42.4	7 18 26.95	21 30 19.9	0.3	1.3	0.10
31	12 38.3	7 18 19.85	+21 30 33.7	0.3	1.3	0.10
32	12 34.3	7 18 12.72	+21 30 47.5	0.3	1.3	0.10

PART III

PHENOMENA

In the year 1909 there will be four eclipses, two of the Sun and two of the Moon.

I.—*A Total Eclipse of the Moon*, 1909, June 3, partly visible at Washington, the Moon rising eclipsed; the beginning visible generally in South America, Africa, Europe and southwestern Asia, the ending visible generally in Africa, central and western Europe, South America, and North America except the northwestern portion.

ELEMENTS OF THE ECLIPSE.

	d	h	m	s
Greenwich mean time of ☍ in right ascension, June	3	13	19	7.9

	h	m	s				s	
Sun's right ascension	4	45	17.68		Hourly motion		10.26	
Moon's right ascension	16	45	17.68		Hourly motion		137.03	
	°	′	″			′	″	
Sun's declination	22	20	27.5	N	Hourly motion	0	18.3	N.
Moon's declination	21	58	40.7	S	Hourly motion	7	5.6	S.
Sun's equa. hor. parallax			8.7		Sun's true semidiameter	15	45.8	
Moon's equa. hor. parallax		56	35.7		Moon's true semidiameter	15	24.6	

CIRCUMSTANCES OF THE ECLIPSE.

		d	h	m	
Moon enters penumbra	June	3	10	36.3	Greenwich Mean Time.
Moon enters shadow		3	11	43.4	
Total eclipse begins		3	12	58.0	
Middle of the eclipse		3	13	28.8	
Total eclipse ends		3	13	59.7	
Moon leaves shadow		3	15	14.3	
Moon leaves penumbra		3	16	21.3	

Contacts of shadow with Moon's limb.	Angles of position from the north point.	The Moon being in the zenith in longitude from Greenwich,	and in latitude.
	°	° ′	° ′
First	125 to E.	2 48 E.	21 47 S.
Last	99 to W.	48 5 W.	22 12 S.

Magnitude of the eclipse = 1.164 (Moon's diameter = 1.0).

II.—*A Central Eclipse of the Sun*, 1909, June 17, visible at Washington as a partial eclipse, the sun setting eclipsed. The central eclipse will begin as an annular eclipse, will change in a few seconds to a total eclipse, will remain so until within a fraction of a minute of its end, when it will change back to an annular eclipse.

ELEMENTS OF THE ECLIPSE.

	d	h	m	s
Greenwich mean time of ☌ in right ascension, June	17	11	31	14.0

	h	m	s			s	s	
Sun and Moon's R. A.	5	42	54.68		Hourly motions	10.40 and	147.49	
	°	′	″			′	″	
Sun's declination	23	23	36.6	N.	Hourly motion	0	4.2	N.
Moon's declination	24	15	36.9	N.	Hourly motion	4	4.0	N.
Sun's equa. hor. parallax			8.7		Sun's true semidiameter	15	44.3	
Moon's equa. hor. parallax		57	44.2		Moon's true semidiameter	15	43.2	

CIRCUMSTANCES OF THE ECLIPSE.

		Greenwich Mean Time.			Longitude from Greenwich.			Latitude.		
		d	h	m	°	′		°	′	
Eclipse begins	June	17	9	0.4	123	3.3	E.	25	40.8	N.
Central eclipse begins		17	10	30.3	81	31.6	E.	50	1.7	N.
Central eclipse changes from annular to total		17	10	30.5	84	17.1	E.	51	29.6	N.
Central eclipse at noon		17	11	31.2	172	39.1	W.	88	22.1	N.
Central eclipse changes from total to annular		17	12	5.9	47	25.5	W.	64	15.0	N.
Central eclipse ends		17	12	6.8	41	58.7	W.	60	23.2	N.
Eclipse ends		17	13	36.8	93	48.2	W.	38	38.6	N.

III.—*A Total Eclipse of the Moon*, 1909, November 26, visible at Washington; the beginning visible generally in North and South America and northeastern Asia, the ending visible generally in North America, northwestern South America, eastern and northern Asia and Australia.

ELEMENTS OF THE ECLIPSE.

	d	h	m	s
Greenwich mean time of ☍ in right ascension, November	26	20	46	17.7

	h	m	s				s	
Sun's right ascension	16	10	3.32		Hourly motion		10.67	
Moon's right ascension	4	10	3.32		Hourly motion		151.26	
	°	′	″			′	″	
Sun's declination	21	2	56.9	S.	Hourly motion	0	27.9	S.
Moon's declination	20	45	56.0	N.	Hourly motion	10	3.0	N.
Sun's equa. hor. parallax			8.9		Sun's true semidiameter	16	12.8	
Moon's equa. hor. parallax		60	11.5		Moon's true semidiameter	16	23.3	

CIRCUMSTANCES OF THE ECLIPSE.

		d	h	m	
Moon enters penumbra	November	26	18	11.6	Greenwich Mean Time.
Moon enters shadow		26	19	11.0	
Total eclipse begins		26	20	13.6	
Middle of the eclipse		26	20	54.6	
Total eclipse ends		26	21	35.6	
Moon leaves shadow		26	22	38.2	
Moon leaves penumbra		26	23	37.6	

Contacts of shadow with Moon's limb.	Angles of position from the north point.	The Moon being in the zenith in longitude from Greenwich,	and in latitude.
	°	° ′	° ′
First	58 to E.	111 48 W.	20 30 N.
Last	91 to W.	161 34 W.	21 4 N.

Magnitude of the eclipse = 1.372 (Moon's diameter = 1.0).

IV.—*A Partial Eclipse of the Sun*, 1909, December 12, invisible at Washington.

ELEMENTS OF THE ECLIPSE.

	d	h	m	s
Greenwich mean time of ☌ in right ascension, December	12	8	9	29.3

	h	m	s				s	
Sun and Moon's R. A.	17	17	19.09		Hourly motions		11.03 and 137.07	
	°	′	″			′	″	
Sun's declination	23	5	21.6	S.	Hourly motion	0	11.2	S.
Moon's declination	24	15	44.2	S.	Hourly motion	5	9.3	S.
Sun's equa. hor. parallax			8.9		Sun's true semidiameter	16	14.8	
Moon's equa. hor. parallax		55	47.9		Moon's true semidiameter	15	11.5	

CIRCUMSTANCES OF THE ECLIPSE.

		Greenwich Mean Time.			Longitude from Greenwich.			Latitude.		
		d	h	m	°	′		°	′	
Eclipse begins	December	12	5	56.6	159	5.9	E.	39	1.1	S.
Greatest eclipse		12	7	44.9	85	48.8	E.	65	3.4	S.
Eclipse ends		12	9	32.9	17	27.9	W.	54	52.9	S.

Magnitude of greatest eclipse = 0.541 (Sun's diameter = 1.0).

The regions within which the eclipses of the Sun are visible are laid down on the accompanying charts, from which, by means of the dotted lines, the Greenwich mean times of beginning and ending at any place may be found with an uncertainty which will vary from three or four minutes for a high Sun to fifteen or twenty minutes when the Sun is near the horizon.

BESSELIAN ELEMENTS OF THE CENTRAL ECLIPSE OF THE SUN, 1909, JUNE 17.

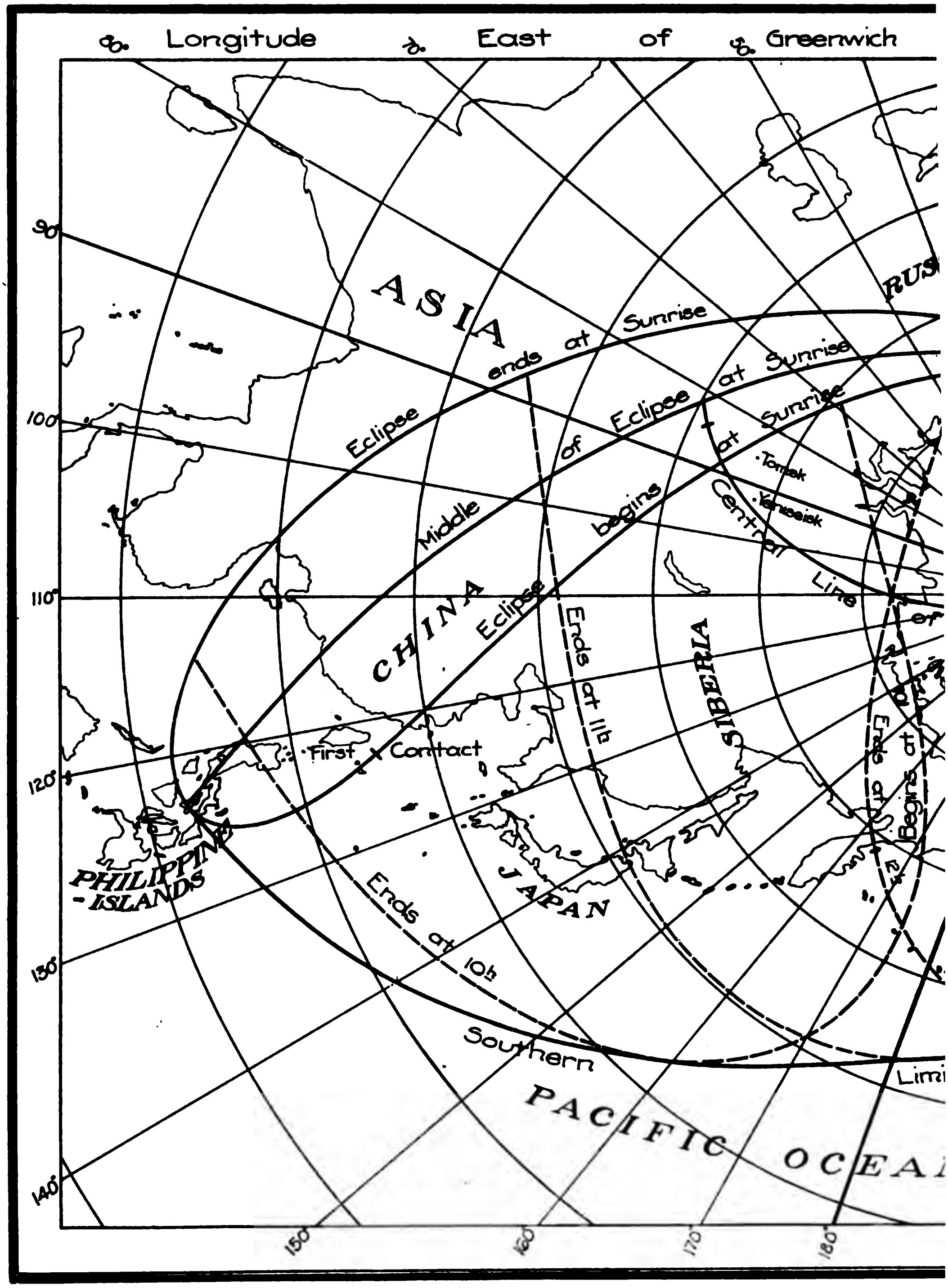
Greenwich Mean Time.	Co-ordinates of Center of Shadow on Fundamental Plane.		Direction of Axis of Shadow.			Radius of Penumbra and Shadow on Fundamental Plane.	
	x	y	Log sin d	Log cos d	μ	l_1	l_2
h m					° ′		
9 0	− 1.36739	+ 0.72586	+ 9.59876	+ 9.96276	134 50.7	+ 0.54587	− 0.00005
10	1.27699	0.73765	9.59876	9.96276	137 20.7	0.54590	− 0.00002
20	1.18658	0.74943	9.59876	9.96276	139 50.7	0.54593	+ 0.00001
30	1.09618	0.76120	9.59876	9.96276	142 20.7	0.54595	0.00004
40	1.00577	0.77295	9.59877	9.96276	144 50.7	0.54598	0.00006
50	0.91536	0.78470	9.59877	9.96276	147 20.7	0.54600	0.00009
10 0	− 0.82494	+ 0.79644	+ 9.59877	+ 9.96276	149 50.7	+ 0.54603	+ 0.00011
10	0.73453	0.80816	9.59878	9.96276	152 20.7	0.54605	0.00014
20	0.64411	0.81987	9.59878	9.96276	154 50.7	0.54608	0.00016
30	0.55369	0.83158	9.59878	9.96276	157 20.7	0.54610	0.00018
40	0.46327	0.84327	9.59879	9.96276	159 50.7	0.54612	0.00021
50	0.37284	0.85495	9.59879	9.96276	162 20.6	0.54615	0.00023
11 0	− 0.28242	+ 0.86661	+ 9.59879	+ 9.96276	164 50.6	+ 0.54617	+ 0.00025
10	0.19200	0.87827	9.59879	9.96276	167 20.6	0.54619	0.00027
20	0.10157	0.88992	9.59880	9.96276	169 50.6	0.54621	0.00029
30	− 0.01115	0.90155	9.59880	9.96276	172 20.6	0.54623	0.00031
40	+ 0.07928	0.91317	9.59880	9.96275	174 50.6	0.54625	0.00033
50	0.16970	0.92478	9.59881	9.96275	177 20.6	0.54626	0.00034
12 0	+ 0.26013	+ 0.93638	+ 9.59881	+ 9.96275	179 50.6	+ 0.54628	+ 0.00036
10	0.35056	0.94797	9.59881	9.96275	182 20.6	0.54630	0.00038
20	0.44098	0.95955	9.59881	9.96275	184 50.6	0.54631	0.00040
30	0.53140	0.97112	9.59882	9.96275	187 20.6	0.54633	0.00041
40	0.62183	0.98267	9.59882	9.96275	189 50.6	0.54634	0.00042
50	0.71225	0.99421	9.59882	9.96275	192 20.6	0.54636	0.00044
13 0	+ 0.80267	+ 1.00574	+ 9.59883	+ 9.96275	194 50.5	+ 0.54637	+ 0.00045
10	0.89309	1.01726	9.59883	9.96275	197 20.5	0.54638	0.00047
20	0.98351	1.02877	9.59883	9.96275	199 50.5	0.54640	0.00048
30	1.07392	1.04027	9.59884	9.96275	202 20.5	0.54641	0.00049
40	+ 1.16434	+ 1.05175	+ 9.59884	+ 9.96275	204 50.5	+ 0.54642	+ 0.00050

Greenwich Mean Time.	Log x' for 1 Minute.	Log y' for 1 Minute.	Log μ' for 1 Minute.	Log Tangents of Angles of Cones.	
				Penumbra.	Shadow.
h m					
9 0	+ 7.9562	+ 7.0718	+ 1.1761	+ 7.66288	+ 7.66071
10 0	7.9562	7.0693	1.1761	7.66288	7.66071
11 0	7.9563	7.0668	1.1761	7.66288	7.66071
12 0	7.9563	7.0642	1.1761	7.66288	7.66071
13 0	7.9563	7.0616	1.1761	7.66288	7.66071
14 0	+ 7.9562	+ 7.0590	+ 1.1761	+ 7.66288	+ 7.66071

PATH OF THE ANNULUS AND SHADOW.

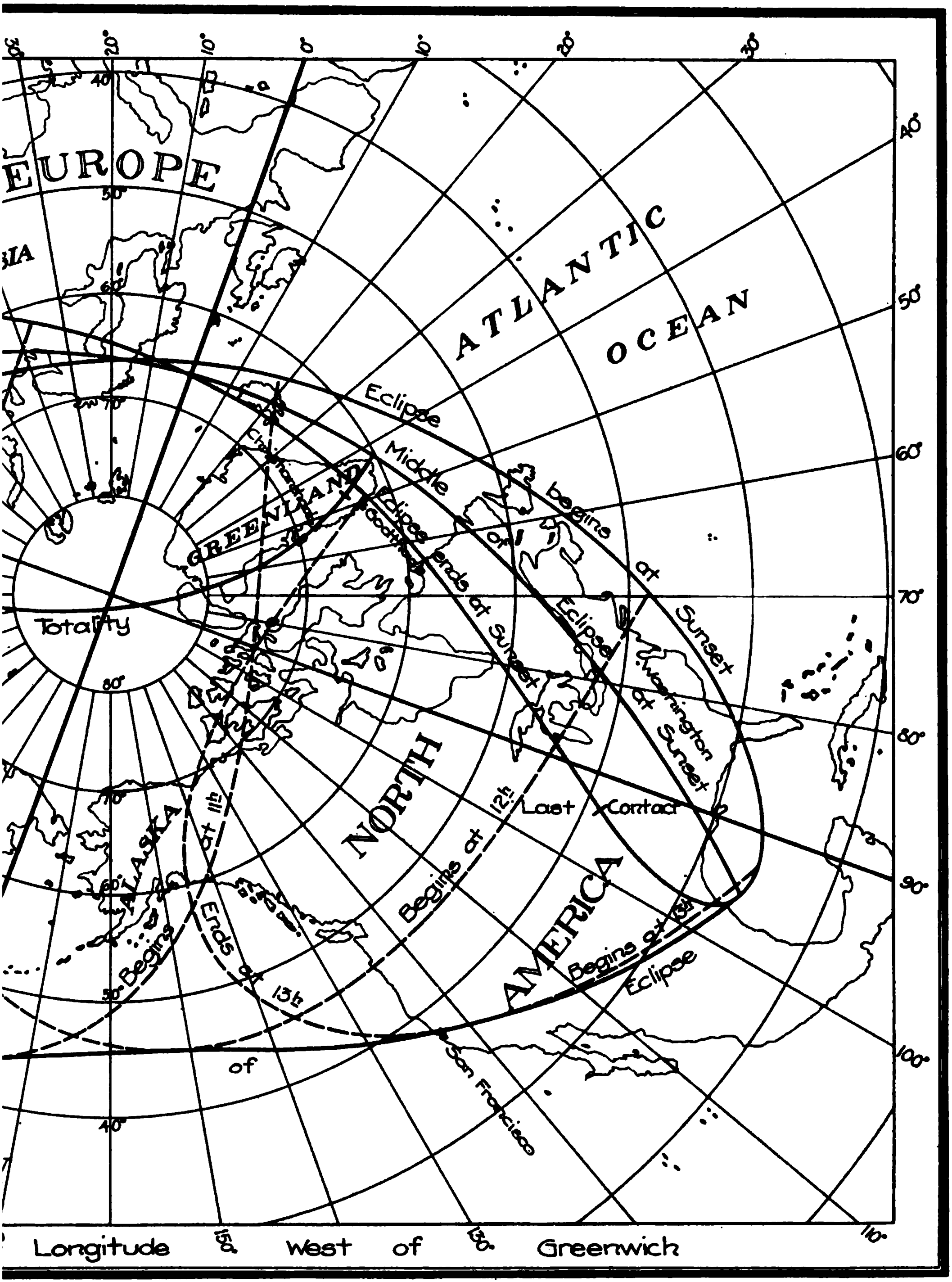
Greenwich Mean Time.	Central Line.		Duration of Annulus or Totality on Central Line.	Greenwich Mean Time.	Central Line.		Duration of Annulus or Totality on Central Line.
	Latitude.	Longitude from Greenwich.			Latitude.	Longitude from Greenwich.	
h m	° ′	° ′	m s	h m	° ′	° ′	m s
Limits.	+ 50 1.7	81 31.6 E.	. . . . .	11 20	+ 83 34.4	125 24 E.	0 23.2
				30	88 4.4	168 22 E.	0 22.0
	Eclipse	Annular.		40	85 27.8	82 23 W.	0 19.4
				50	79 35.7	66 49 W.	0 15.2
10 30.5	+ 51 29.6	84 17.1 E.	0 0.0	12 0	72 1.5	57 1.4 W.	0 8.2
				5	+ 66 6.9	49 50.6 W.	0 2.0
	Eclipse	Total.					
					Eclipse	Total.	
10 35	+ 57 52.6	93 56.6 E.	0 8.2				
40	61 52.5	98 43.7 E.	0 12.5	12 5.9	+ 64 15.0	47 25.5 W.	0 0.0
50	68 9.3	105 12.7 E.	0 18.1				
					Eclipse	Annular.	
11 0	+ 73 34.2	110 30.9 E.	0 21.3				
10	+ 78 38.7	116 14.0 E.	0 22.9	Limits.	+ 60 23.2	41 58.7 W.	. . . . .

CENTRAL ECLIPSE OF



Note:- The hours of beginning and

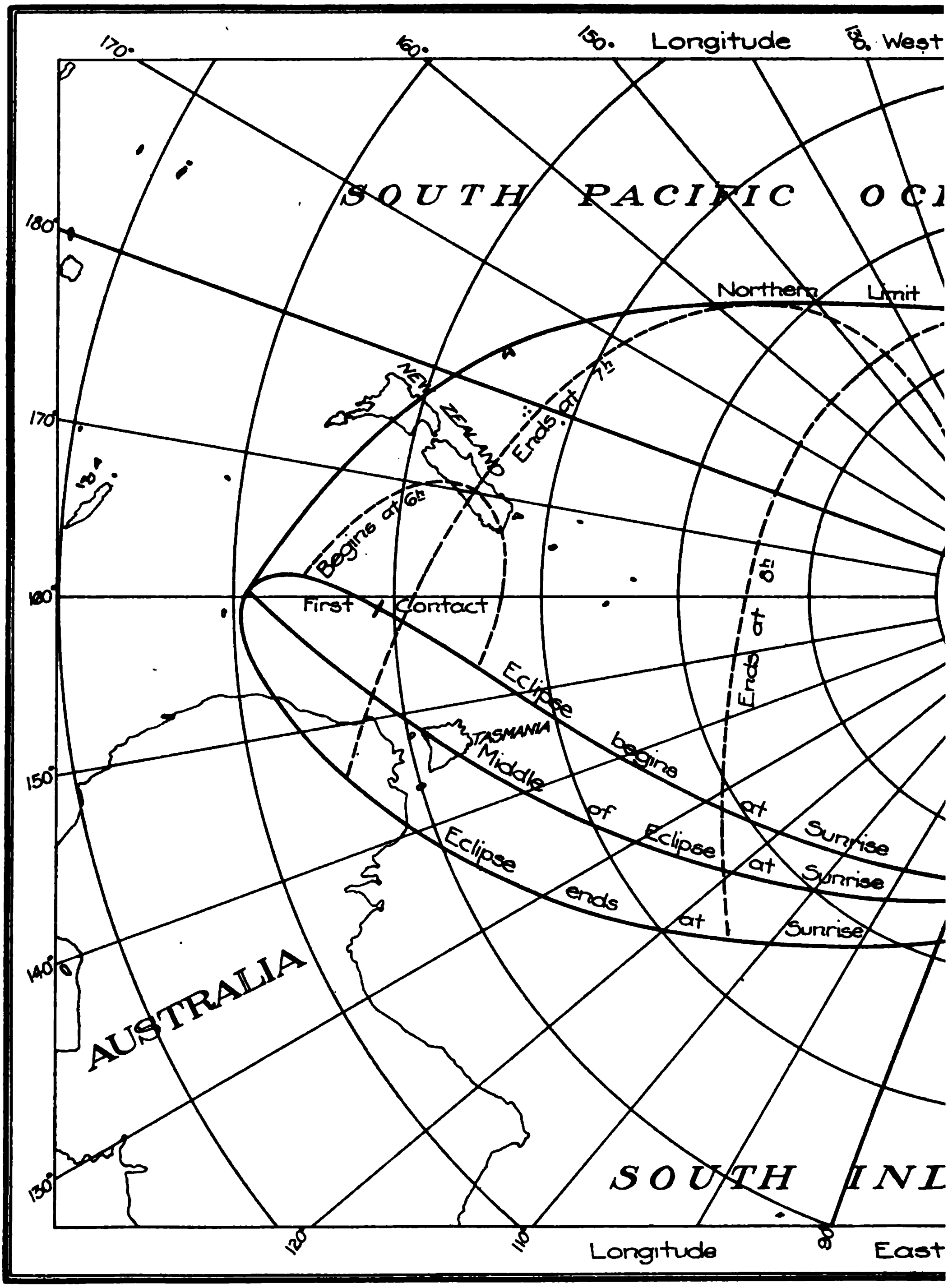
THE SUN JUNE 17TH 1909.



THE NORRIS PETERS CO., PHOTO-LITHO. WASHINGTON, D. C.

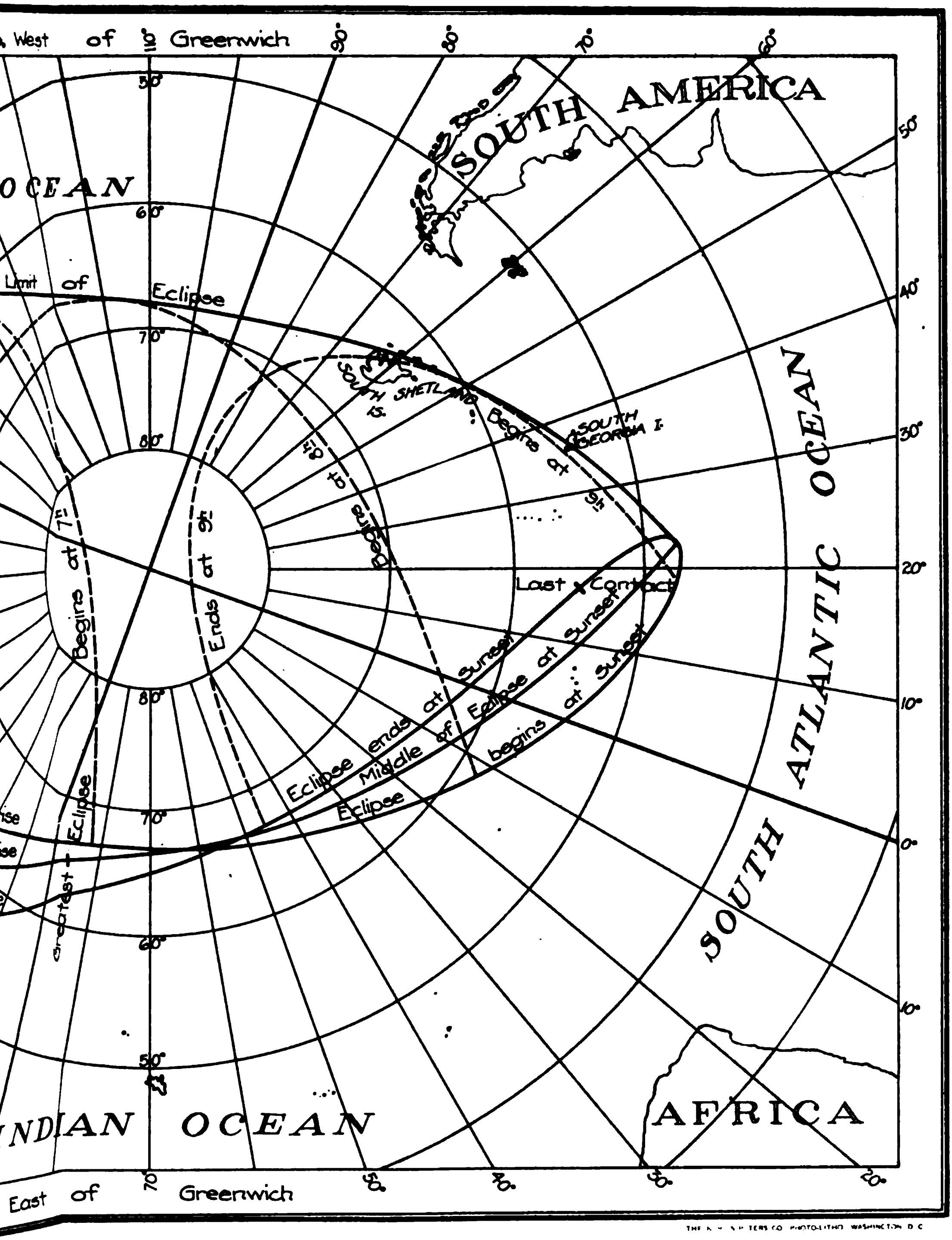
nding are expressed in Greenwich Mean Time

PARTIAL ECLIPSE OF T



Note:- The hours of beginning and en

F THE SUN DEC. 12TH 1909.



THE NORRIS PETERS CO. PHOTO-LITHO. WASHINGTON D. C.

and ending are expressed in Greenwich Mean Time

BESSELIAN ELEMENTS OF THE PARTIAL ECLIPSE OF THE SUN, 1909, DECEMBER 12.

Greenwich Mean Time.	Co-ordinates of Center of Shadow on Fundamental Plane.		Direction of Axis of Shadow.			Radius of Penumbra on Fundamental Plane.
	x	y	Log sin d	Log cos d	μ	l
h m					° ′	
5 50	−1.199 79	−1.057 09	−9.593 29	+9.963 77	89 3.4	+0.565 13
6 0	−1.113 80	−1.072 04	−9.593 30	+9.963 77	91 33.4	+0.565 12
10	1.027 81	1.086 98	9.593 31	9.963 77	94 3.4	0.565 11
20	0.941 81	1.101 91	9.593 32	9.963 77	96 33.3	0.565 09
30	0.855 81	1.116 82	9.593 33	9.963 76	99 3.3	0.565 08
40	0.769 81	1.131 73	9.593 34	9.963 76	101 33.3	0.565 07
50	0.683 80	1.146 62	9.593 34	9.963 76	104 3.2	0.565 05
7 0	−0.597 79	−1.161 51	−9.593 35	+9.963 76	106 33.2	+0.565 04
10	0.511 77	1.176 38	9.593 36	9.963 76	109 3.2	0.565 02
20	0.425 75	1.191 24	9.593 37	9.963 76	111 33.1	0.565 01
30	0.339 73	1.206 09	9.593 38	9.963 75	114 3.1	0.564 99
40	0.253 70	1.220 92	9.593 39	9.963 75	116 33.0	0.564 98
50	0.167 67	1.235 75	9.593 40	9.963 75	119 3.0	0.564 96
8 0	−0.081 64	−1.250 56	−9.593 41	+9.963 75	121 33.0	+0.564 94
10	+0.004 40	1.265 36	9.593 41	9.963 75	124 2.9	0.564 92
20	0.090 44	1.280 15	9.593 42	9.963 75	126 32.9	0.564 90
30	0.176 48	1.294 93	9.593 43	9.963 74	129 2.9	0.564 88
40	0.262 52	1.309 70	9.593 44	9.963 74	131 32.8	0.564 86
50	0.348 57	1.324 45	9.593 45	9.963 74	134 2.8	0.564 84
9 0	+0.434 61	−1.339 19	−9.593 46	+9.963 74	136 32.8	+0.564 82
10	0.520 66	1.353 92	9.593 47	9.963 74	139 2.7	0.564 80
20	0.606 71	1.368 64	9.593 47	9.963 74	141 32.7	0.564 77
30	0.692 76	1.383 35	9.593 48	9.963 74	144 2.7	0.564 75
40	+0.778 82	−1.398 04	−9.593 49	+9.963 73	146 32.6	+0.564 73

Greenwich Mean Time.	Log x' for 1 Minute.	Log y' for 1 Minute.	Log μ' for 1 Minute.	Log Tangent of Angle of Cone—
				Penumbra.
h m				
5 0	+7.9343	−7.1765	+1.1760	+7.676 76
6 0	7.9344	7.1745	1.1760	7.676 76
7 0	7.9346	7.1725	1.1760	7.676 76
8 0	7.9347	7.1705	1.1760	7.676 76
9 0	7.9347	7.1684	1.1760	7.676 76
10 0	+7.9348	−7.1662	+1.1760	+7.676 76

WASHINGTON MEAN TIME.

PHASES OF THE MOON.

New Moon.

	d	h	m
January	21	7	3.5
February	19	17	43.8
March	21	3	3.0
April	19	11	43.0
May	18	20	33.7
June	17	6	20.0
July	16	17	36.3
August	15	6	46.4
September	13	22	0.4
October	13	15	5.1
November	12	9	10.0
December	12	2	50.4

First Quarter.

	d	h	m
January	27	21	59.1
February	26	9	40.8
March	27	23	40.4
April	26	15	27.9
May	26	8	19.5
June	25	1	34.5
July	24	18	37.0
August	23	10	47.0
September	22	1	23.2
October	21	13	55.3
November	20	0	20.8
December	19	9	9.4

Full Moon.

	d	h	m
January	5	21	4.4
February	4	15	16.6
March	6	9	47.5
April	5	3	20.1
May	4	18	59.5
June	3	8	16.4
July	2	19	9.0
August	1	4	5.7
August	30	11	59.5
September	28	19	57.1
October	28	4	58.7
November	26	15	43.6
December	26	4	21.6

Last Quarter.

	d	h	m
January	14	1	3.0
February	12	19	38.6
March	14	10	33.4
April	12	21	21.9
May	12	4	37.0
June	10	9	34.3
July	9	13	49.8
August	7	19	1.6
September	6	2	36.1
October	5	13	35.9
November	4	4	29.5
December	3	23	4.2

APOGEE, PERIGEE, AND GREATEST LIBRATION.

Apogee.

	d	h
January	10	21.8
February	7	12.2
March	6	14.9
April	2	17.8
April	30	6.8
May	28	0.3
June	24	19.1
July	22	13.2
August	19	5.6
September	15	16.4
October	12	18.5
November	9	0.3
December	6	16.6

Perigee.

	d	h
January	22	20.1
February	20	6.3
March	20	18.3
April	18	3.3
May	16	3.4
June	11	23.2
July	7	2.9
August	3	10.9
August	31	14.2
September	28	23.9
October	27	11.6
November	24	20.4
December	22	15.7

Greatest Libration.

	d	h			d	h	
January	2	16.5	W.	January	17	1.9	E.
January	29	12.1	W.	February	14	8.2	E.
February	26	11.0	W.	March	14	14.4	E.
March	26	17.3	W.	April	11	13.4	E.
April	23	23.0	W.	May	8	16.3	E.
May	21	22.9	W.	June	3	23.1	E.
June	18	11.6	W.	June	30	23.0	E.
July	15	5.0	W.	July	28	15.5	E.
August	10	14.4	W.	August	25	17.2	E.
September	7	0.8	W.	September	22	23.1	E.
October	5	2.3	W.	October	21	4.5	E.
November	2	8.6	W.	November	18	0.1	E.
November	30	14.0	W.	December	14	12.9	E.
December	28	12.3	W.				

FORMULÆ FOR THE LIBRATION OF THE MOON.

Let I = the inclination of the Moon's equator to the ecliptic ($=1^\circ\ 28'.8$),

Ω = the mean longitude of the Moon's ascending node, or the mean longitude of the descending node of the Moon's equator,

C = the angle at the center of the Moon's disk made by a lunar meridian with the circle of declination, counted from north to east on the apparent disk,

$\lambda, \beta, \alpha, \delta$ = the apparent longitude, latitude, right ascension, and declination of the Moon, corrected for parallax,

λ' = the selenocentric longitude of the Earth, counted on the Moon's equator from its descending node, Ω,

$i, \Delta, \Omega', \text{☾}$ = the quantities defined on page 284, where their values for the current year are given.

The Moon's libration in longitude and latitude may then be found, for any time, by means of the following formulæ, in connection with the tables given on pages 284 and 285:—

$$\left.\begin{aligned} \mu &= -0'.574 \sin 2(\Omega - \lambda) \\ A &= \sin I \cos(\Omega - \lambda) \\ \tan B &= \tan I \sin(\Omega - \lambda) \\ \lambda' &= \lambda + \mu + Ab \end{aligned}\right\} \textit{See table, page 285.}$$

$$\text{The libration in latitude} = b = B - \beta$$

$$\text{The libration in longitude} = l = \lambda' - \text{☾}$$

$$\sin C = \sin i \frac{\cos(\lambda' + \Delta - \Omega)}{\cos \delta} = -\sin i \frac{\cos(\alpha - \Omega')}{\cos b}$$

MEAN PLACES FOR 1909.0. (January 0^d.279, Washington.)

Name of Star.	Magnitude.	Right Ascension.	Annual Proper Motion.	Declination.	Annual Proper Motion.
		h m s	s	° ′ ″	″
24 B. Ceti	6.0	0 5 39.336	+ 0.0020	− 5 45 14.36	0.000
54 B. Ceti	6 3	0 19 50.654	− 0.0024	2 43 20.85	− 0.051
14 Ceti	5.4	0 30 52.502	+ 0.0098	− 1 0 19.63	− 0.059
26 Ceti	6.0	0 59 7.985	+ 0.0081	+ 0 52 45.47	− 0.037
33 Ceti	6.1	1 5 52.514	− 0.0010	1 57 41.73	− 0.006
117 G. Piscium	6.5	1 22 11.275	. . . .	+ 3 3 48.83	. . .
μ Piscium	5.0	1 25 24.950	+ 0.0199	5 40 30.94	− 0.027
39 B. Arietis	6.5	2 0 2.964	+ 0.0025	7 17 57.69	− 0.032
64 Ceti	5.8	2 6 32.735	− 0.0092	8 8 39.07	− 0.107
ξ Arietis	5.5	2 19 56.227	+ 0.0006	10 11 55.67	− 0.022
25 Arietis	6.5	2 22 32.873	− 0.0195	+ 9 47 41.37	− 0.200
389 B. Ceti	6.3	2 24 43.686	− 0.0003	9 9 35.06	− 0.003
31 Arietis	5.7	2 31 40.031	+ 0.0189	12 3 12.28	− 0.085
85 Ceti	6.3	2 37 34.814	− 0.0026	10 21 15.23	− 0.012
38 Arietis	5.2	2 39 59.936	+ 0.0081	12 3 47.89	− 0.079
145 B. Arietis	6.5	2 59 36.642	− 0.0021	+ 15 30 10.50	− 0.141
147 B. Arietis	5.8	3 1 23.861	+ 0.0017	12 50 12.01	− 0.072
26 B. Tauri	6.4	3 28 57.181	+ 0.0060	17 32 5.10	− 0.323
30 B. Tauri	6.4	3 32 41.228	+ 0.0015	15 7 56.53	− 0.003
33 B. Tauri	6.3	3 34 16.809	+ 0.0028	16 14 28.63	− 0.026
13 Tauri	5.6	3 37 3.918	+ 0.0003	+ 19 24 33.41	− 0.019
14 Tauri	6.2	3 38 31.368	+ 0.0084	19 22 40.37	− 0.049
148 B. Tauri	5.9	3 47 57.664	+ 0.0085	17 3 23.82	− 0.036
162 B. Tauri	6.3	3 55 24.846	− 0.0003	17 2 24.34	− 0.061
163 B. Tauri	5.8	3 55 34.078	+ 0.0095	17 56 15.82	− 0.039
43 Tauri	5.5	4 3 51.764	+ 0.0079	+ 19 22 8.68	− 0.044
ω Tauri	4.8	4 11 55.617	− 0.0022	20 21 18.96	− 0.055
51 Tauri	5.6	4 12 59.960	+ 0.0071	21 21 26.69	− 0.041
53 Tauri	5.3	4 14 4.195	+ 0.0028	20 55 21.88	− 0.051
56 Tauri	5.2	4 14 13.368	+ 0.0032	21 33 15.26	− 0.040
85 H.′ Tauri	6.0	4 15 7.641	+ 0.0055	+ 18 31 30.98	. . .
224 B. Tauri	6.1	4 17 1.441	− 0.0002	20 36 24.63	− 0.001
227 B. Tauri	5.9	4 18 10.528	+ 0.0019	20 46 13.75	− 0.031
234 B. Tauri	6.0	4 19 38.801	+ 0.0072	18 49 59.34	− 0.060
κ Tauri	4.1	4 19 56.594	+ 0.0062	22 5 10.56	− 0.042
67 Tauri	5.4	4 19 59.716	+ 0.0093	+ 21 59 32.90	− 0.047
υ Tauri	4.2	4 20 51.623	+ 0.0079	22 36 28.02	− 0.047
72 Tauri	5.4	4 21 50.822	+ 0.0004	22 47 30.75	− 0.008
247 B. Tauri	5.8	4 22 36.587	+ 0.0073	21 25 2.11	− 0.076
282 B. T uri	6.4	4 30 22.371	− 0.0028	19 41 40.51	+ 0.018
284 B. Tauri	6.0	4 31 0.2S0	+ 0.0109	+ 23 9 19.59	− 0.102
129 H.′ Tauri	5.8	4 32 53.707	+ 0.0013	20 30 8.75	− 0.010
300 B. Tauri	6.2	4 40 12.738	+ 0.0005	23 27 41.86	+ 0.004
99 Tauri	6.0	4 52 17.282	+ 0.0003	23 48 25.09	− 0.035
ι Tauri	4.7	4 57 39.331	+ 0.0056	21 27 37.90	− 0.049
330 B. Tauri	6.3	4 58 56.228	+ 0.0028	+ 21 9 2.74	− 0.034
105 Tauri	6.0	5 2 28.884	+ 0.0004	21 35 5.81	− 0.007
103 Tauri	5.5	5 2 33.848	+ 0.0003	24 8 43.51	− 0.022
108 Tauri	6.2	5 9 59.419	− 0.0005	22 10 52.65	− 0.025
n Tauri	5.1	5 13 48.523	+ 0.0021	22 0 10.89	− 0.083
o Tauri	4.8	5 22 10.111	+ 0.0006	+ 21 51 35.48	− 0.010
118 Tauri	5.4	5 23 40.440	+ 0.0015	25 4 38.54	− 0.038
121 Tauri	5.1	5 29 53.597	+ 0.0010	23 58 46.84	− 0.031
125 Tauri	5.1	5 34 5.810	+ 0.0018	25 50 48.10	− 0.029
175 H.′ Tauri	6.5	5 36 33.799	− 0.0020	22 36 56.27	+ 0.018
394 B. Tauri	6.0	5 37 47.948	+ 0.0011	+ 23 9 41.90	− 0.042

MEAN PLACES FOR 1909.0. (January $0^d.279$, Washington.)

Name of Star.	Magnitude.	Right Ascension.	Annual Proper Motion.	Declination.	Annual Proper Motion.
		h m s	s	° ′ ″	″
132 Tauri	5.0	5 43 25.857	0.0000	+ 24 32 15.58	− 0.023
412 B. Tauri	5.8	5 51 21.763	....	24 14 13.04	...
139 Tauri	4.7	5 52 20.862	0.0000	25 56 35.80	− 0.007
1 Geminorum	4.1	5 58 35.326	+ 0.0002	23 16 7.89	− 0.109
3 Geminorum	5.6	6 4 12.493	+ 0.0014	23 7 44.43	+ 0.001
5 Geminorum	5.9	6 5 57.495	+ 0.0011	+ 24 26 27.28	− 0.061
6 Geminorum	6.3	6 6 48.137	+ 0.0007	22 55 46.89	− 0.013
8 Geminorum	6.1	6 10 45.459	− 0.0009	23 59 59.92	− 0.026
9 Geminorum	6.2	6 11 25.633	+ 0.0004	23 46 20.37	− 0.008
36 B. Geminorum	6.0	6 20 1.104	− 0.0004	23 22 41.49	+ 0.015
52 B. Geminorum	6.5	6 31 52.547	− 0.0021	+ 24 40 0.93	− 0.002
87 B. Geminorum	5.8	6 46 28.607	− 0.0006	23 42 35.57	− 0.021
37 Geminorum	5.7	6 49 42.952	− 0.0028	25 29 24.63	+ 0.014
39 Geminorum	6.2	6 53 10.983	− 0.0117	26 12 4.43	+ 0.086
40 Geminorum	6.3	6 53 50.858	− 0.0012	26 2 17.93	− 0.015
ω Geminorum	5.2	6 56 52.170	− 0.0003	+ 24 20 45.02	0.000
47 Geminorum	5.6	7 5 44.533	− 0.0011	27 0 24.00	− 0.051
48 Geminorum	5.8	7 6 54.710	− 0.0009	24 16 53.52	− 0.041
52 Geminorum	6.1	7 9 8.117	+ 0.0038	25 2 37.59	− 0.086
134 B. Geminorum	6.5	7 11 25.265	+ 0.0058	26 51 14.49	− 0.134
A Geminorum	5.1	7 17 55.710	− 0.0051	+ 25 13 33.77	− 0.014
58 Geminorum	6.0	7 18 0.098	− 0.0022	23 7 15.44	− 0.054
B. D. + 23°, 1744	6.4	7 27 23.502	− 0.0010	23 4 55.82	− 0.007
176 B. Geminorum	6.3	7 32 44.138	+ 0.0038	24 33 52.53	− 0.029
181 B. Geminorum	6.0	7 33 42.206	+ 0.0006	24 25 45.03	− 0.029
187 B. Geminorum	6.3	7 35 31.760	+ 0.0011	+ 23 13 47.44	+ 0.007
κ Geminorum	3.6	7 38 57.362	− 0.0014	24 37 0.45	− 0.060
82 Geminorum	6.3	7 43 7.254	− 0.0010	23 22 0.33	− 0.001
5 B. Cancri	6.4	7 55 34.896	− 0.0003	23 50 1.36	− 0.047
4 Cancri	6.2	7 56 14.584	− 0.0012	25 20 25.91	+ 0.007
9 Cancri	6.2	8 0 54.902	− 0.0009	+ 22 53 44.88	− 0.018
35 B. Cancri	6.4	8 8 18.329	− 0.0017	23 24 43.36	− 0.022
λ Cancri	5.9	8 15 7.639	− 0.0011	24 18 33.90	− 0.028
28 Cancri	6.1	8 23 13.184	− 0.0023	24 26 50.43	− 0.072
υ^1 Cancri	5.7	8 26 7.821	− 0.0056	24 23 18.38	− 0.069
υ^2 Cancri	6.4	8 27 37.494	− 0.0047	+ 24 23 41.26	− 0.068
ξ Cancri	5.2	9 4 7.804	+ 0.0011	22 24 50.54	+ 0.002
79 Cancri	6.1	9 5 7.328	+ 0.0003	22 21 58.80	− 0.005
90 H.′ Cancri	6.1	9 8 25.569	− 0.0007	21 39 30.72	− 0.013
57 B. Leonis	6.5	9 39 26.560	+ 0.0020	19 16 56.12	− 0.077
107 B. Leonis	6.3	10 0 44.859	− 0.0023	+ 16 12 2.82	+ 0.017
η Leonis	3.6	10 2 22.313	− 0.0022	17 12 24.36	− 0.004
42 Leonis	6.1	10 16 56.816	− 0.0017	15 26 4.49	− 0.027
46 Leonis	5.8	10 27 20.425	− 0.0024	14 36 16.60	+ 0.022
k Leonis	5.5	10 41 30.202	− 0.0089	14 40 31.47	− 0.064
ι Leonis	4.1	11 19 10.861	+ 0.0103	+ 11 1 50.19	− 0.083
ω Virginis	5.4	11 33 46.110	− 0.0005	8 38 16.56	− 0.012
ξ Virginis	4.8	11 40 35.662	+ 0.0045	8 45 50.39	− 0.034
ν Virginis	4.2	11 41 10.960	− 0.0014	7 2 21.85	− 0.186
A^1 Virginis	5.1	11 43 14.438	− 0.0038	8 45 4.78	+ 0.004
36 B. Virginis	6.5	11 59 5.814	− 0.0095	+ 6 3 59.96	− 0.076
11 Virginis	5.6	12 5 25.188	− 0.0100	6 18 47.01	+ 0.026
c Virginis	5.1	12 15 43.667	− 0.0198	3 49 9.50	− 0.072
250 B. Virginis	5.9	12 33 43.943	− 0.0042	+ 2 21 19.92	− 0.021
65 Virginis	6.0	13 18 35.879	− 0.0016	− 4 26 54.83	− 0.016
66 Virginis	5.7	13 19 48.918	+ 0.0105	− 4 41 19.02	− 0.030

MEAN PLACES FOR 1909.0. (January $0^d.279$, Washington.)

Name of Star.	Magnitude.	Right Ascension.	Annual Proper Motion.	Declination.	Annual Proper Motion.
		h m s	s	° ′ ″	″
72 Virginis	6.1	13 25 40.766	+ 0.0023	− 6 0 2.69	+ 0.014
l Virginis	4.8	13 27 13.943	− 0.0069	5 47 10.13	− 0.045
80 Virginis	5.6	13 30 47.154	+ 0.0010	4 55 58.21	+ 0.075
566 B. Virginis	6.4	13 39 10.022	− 0.0049	5 2 26.64	− 0.025
88 Virginis	6.5	13 43 32.235	− 0.0032	6 23 0.93	− 0.033
598 B. Virginis	6.1	13 50 11.696	− 0.0121	− 7 36 40.80	− 0.048
623 B. Virginis	6.5	13 59 32.268	− 0.0026	8 49 14.20	+ 0.006
95 Virginis	5.4	14 1 53.937	− 0.0098	8 52 46.09	+ 0.011
96 Virginis	6.5	14 4 9.578	− 0.0005	9 54 13.50	+ 0.016
2 Libræ	6.3	14 18 31.690	− 0.0014	11 17 55.50	− 0.066
4 G. Libræ	6.5	14 19 47.302	− 0.0046	− 11 15 24.28	− 0.028
6 B. Libræ	6.2	14 32 9.224	− 0.0591	11 55 7.07	+ 0.384
22 B. Libræ	6.4	14 42 56.880	+ 0.0013	12 27 25.75	− 0.083
μ Libræ	5.4	14 44 19.620	− 0.0053	13 46 12.99	− 0.028
13 Libræ	5.7	14 49 26.293	− 0.0048	11 31 38.76	− 0.020
ν Libræ	5.3	15 1 32.875	− 0.0035	− 15 54 16.10	− 0.037
22 Libræ	6.5	15 1 44.123	− 0.0050	16 7 56.77	− 0.030
o Libræ	6.2	15 15 56.028	+ 0.0019	15 13 14.05	+ 0.024
32 Libræ	5.9	15 23 7.326	+ 0.0006	16 23 59.08	− 0.043
34 Libræ	6.0	15 25 32.230	+ 0.0012	16 17 51.40	− 0.007
ζ Libræ	5.6	15 27 46.615	− 0.0012	− 16 32 41.60	− 0.033
41 Libræ	5.3	15 33 40.147	+ 0.0069	19 0 8.75	− 0.058
κ Libræ	5.0	15 36 42.046	− 0.0035	19 23 2.89	− 0.106
λ Libræ	4.9	15 48 2.934	− 0.0017	19 53 44.47	− 0.046
θ Libræ	4.4	15 48 38.513	+ 0.0066	16 27 46.07	+ 0.119
47 Libræ	5.8	15 49 44.720	− 0.0010	− 19 6 52.77	− 0.020
56 B. Scorpii	5.0	16 0 9.042	− 0.0010	19 33 11.27	− 0.005
ω^1 Scorpii	4.3	16 1 28.877	− 0.0015	20 25 24.04	− 0.039
ω^2 Scorpii	4.6	16 2 4.002	+ 0.0030	20 37 24.79	− 0.061
73 B. Scorpii	6.4	16 4 40.721	− 0.0056	18 5 56.54	− 0.007
ν Scorpii	3.9	16 6 42.217	− 0.0017	− 19 13 29.63	− 0.041
84 B. Scorpii	6.3	16 9 7.734	− 0.0013	20 52 36.20	− 0.043
88 B. Scorpii	6.4	16 9 23.993	− 0.0095	18 18 9.27	− 0.132
51 G. Scorpii	6.5	16 11 36.923	− 0.0011	21 4 40.62	− 0.029
58 G. Scorpii	6.2	16 13 47.858	+ 0.0002	19 59 46.86	− 0.008
ψ Ophiuchi	4.6	16 18 46.598	− 0.0014	− 19 49 29.89	− 0.060
ω Ophiuchi	4.5	16 26 44.428	+ 0.0014	21 16 19.94	+ 0.026
123 B. Scorpii	6.5	16 35 12.547	+ 0.0008	20 13 53.48	+ 0.037
131 B. Scorpii	5.5	16 36 32.642	+ 0.0021	19 45 1.51	+ 0.045
68 B. Ophiuchi	5.9	16 48 2.776	− 0.0032	20 15 49.89	− 0.040
24 Ophiuchi	5.5	16 51 18.672	+ 0.0001	− 23 0 23.47	− 0.034
116 B. Ophiuchi	6.3	17 0 45.693	− 0.0022	21 26 20.42	− 0.083
39 Ophiuchi	5.1	17 12 27.606	− 0.0046	24 11 18.06	− 0.011
190 B. Ophiuchi	5.9	17 19 15.454	− 0.0008	21 21 26.47	− 0.045
191 B. Ophiuchi	6.3	17 19 32.422	+ 0.0010	24 9 39.33	+ 0.017
51 Ophiuchi	4.8	17 25 51.757	0.0000	− 23 53 34.23	− 0.030
52 Ophiuchi	6.4	17 29 49.985	− 0.0007	21 58 58.22	− 0.004
63 Ophiuchi	6.1	17 49 18.064	− 0.0001	24 52 10.53	− 0.015
4 Sagittarii	4.8	17 54 14.178	+ 0.0001	23 48 30.19	− 0.058
21 G. Sagittarii	5.7	17 56 23.564	− 0.0013	22 46 42.80	− 0.044
7 Sagittarii	5.5	17 57 16.482	− 0.0003	− 24 16 55.43	− 0.007
9 Sagittarii	6.0	17 58 17.619	− 0.0006	24 21 47.24	− 0.006
1 Sagittarii	5.2	18 6 10.189	+ 0.0018	23 43 13.35	− 0.043
67 B. Sagittarii	6.4	18 13 3.698	− 0.0044	25 38 21.77	− 0.062
70 B. Sagittarii	6.4	18 15 55.287	+ 0.0014	24 57 24.25	− 0.001
68 G. Sagittarii	6.2	18 22 3.374	0.0000	− 26 41 20.97	− 0.046

MEAN PLACES FOR 1909.0. (January 0^d.279, Washington.)

Name of Star.	Magnitude.	Right Ascension.	Annual Proper Motion.	Declination.	Annual Proper Motion.
		h m s	s	° ′ ″	″
69 G. Sagittarii	6.3	18 22 25.584	+ 0.0018	− 26 48 43.76	− 0.032
86 B. Sagittarii	6.5	18 23 16.880	− 0.0063	26 38 24.40	− 0.054
24 Sagittarii	5.7	18 28 19.956	− 0.0002	24 6 2.93	− 0.020
117 B. Sagittarii	5.8	18 32 58.604	− 0.0015	23 34 59.16	− 0.020
26 Sagittarii	6.1	18 36 18.639	+ 0.0021	23 55 7.41	− 0.023
126 B. Sagittarii	5.7	18 39 13.939	− 0.0008	− 25 6 10.81	− 0.041
154 B. Sagittarii	5.9	18 50 30.094	− 0.0010	23 17 24.99	− 0.021
162 B. Sagittarii	6.4	18 52 45.777	− 0.0009	24 59 55.24	− 0.020
127 G. Sagittarii	6.4	18 54 49.782	+ 0.0023	25 4 9.09	+ 0.051
172 B. Sagittarii	5.8	18 56 53.645	+ 0.0002	24 58 22.03	− 0.172
189 B. Sagittarii	6.1	19 2 41.027	+ 0.0012	− 24 47 59.85	+ 0.001
191 B. Sagittarii	6.5	19 3 14.627	− 0.0011	23 20 3.34	− 0.058
ψ Sagittarii	4.8	19 9 57.686	+ 0.0025	25 24 51.04	− 0.035
208 B. Sagittarii	6.1	19 10 0.626	+ 0.0072	24 20 5.50	− 0.079
χ Sagittarii	4.9	19 19 44.313	+ 0.0033	24 41 8.94	− 0.063
49 Sagittarii	5.5	19 19 59.268	− 0.0017	− 24 8 27.94	+ 0.001
51 Sagittarii	5.8	19 30 30.233	+ 0.0004	24 55 7.62	− 0.005
h Sagittarii	4.7	19 31 10.233	+ 0.0044	25 5 6.26	− 0.027
53 Sagittarii	6.3	19 34 21.440	− 0.0004	23 38 6.85	− 0.037
274 B. Sagittarii	6.1	19 34 39.006	+ 0.0018	23 38 16.46	− 0.031
308 B. Sagittarii	6.3	19 48 50.904	− 0.0095	− 24 10 4.84	− 0.438
329 B. Sarittarii	6.1	19 55 59.515	+ 0.0010	22 59 16.50	− 0.005
336 B. Sagittarii	6.5	19 58 20.863	− 0.0019	22 51 4.20	+ 0.052
4 Capricorni	5.7	20 12 40.674	+ 0.0012	22 5 29.57	− 0.032
36 B. Capricorni	6.2	20 24 11.075	+ 0.0003	22 41 37.51	− 0.027
56 B. Capricorni	6.3	20 34 46.994	+ 0.0376	− 24 6 24.94	+ 0.462
17 Capricorni	5.8	20 40 53.562	+ 0.0011	21 50 42.82	− 0.014
η Capricorni	4.8	20 59 13.679	− 0.0025	20 12 55.52	− 0.047
χ Capricorni	5.3	21 3 21.003	+ 0.0013	21 33 34.79	− 0.059
27 Capricorni	6.1	21 4 20.954	+ 0.0085	20 55 19.95	− 0.123
φ Capricorni	5.3	21 10 27.216	0.0000	− 21 1 47.30	0.000
33 Capricorni	5.3	21 19 0.047	− 0.0013	21 14 20.27	− 0.112
35 Capricorni	6.0	21 22 5.397	− 0.0016	21 35 27.03	− 0.030
128 B. Capricorni	6.5	21 24 53.247	+ 0.0019	19 32 42.42	− 0.027
37 Capricorni	5.7	21 29 44.600	− 0.0016	20 29 25.33	+ 0.025
ε Capricorni	4.7	21 31 59.212	0.0000	− 19 52 27.04	0.000
κ Capricorni	4.8	21 37 34.703	+ 0.0094	19 16 53.09	− 0.006
143 B. Capricorni	6.1	21 38 8.274	+ 0.0067	20 2 12.61	− 0.039
152 B. Capricorni	6.5	21 45 12.710	− 0.0004	17 16 11.56	− 0.054
154 B. Capricorni	6.1	21 46 38.699	+ 0.0103	19 2 50.47	− 0.076
161 B. Capricorni	6.4	21 57 11.357	+ 0.0060	− 18 20 26.85	− 0.090
29 Aquarii (*mean*) . . .	6.5	21 57 27.812	+ 0.0008	17 24 11.91	+ 0.009
56 Aquarii	6.1	22 25 24.844	+ 0.0022	15 3 3.96	− 0.034
69 Aquarii	5.6	22 42 52.955	+ 0.0024	14 32 10.87	− 0.014
τ Aquarii	4.4	22 44 46.522	− 0.0008	14 4 23.01	− 0.033
74 Aquarii	5.8	22 48 41.305	+ 0.0013	− 12 6 2.27	0.000
257 B. Aquarii	6.3	22 54 48.194	− 0.0026	13 33 30.22	+ 0.034
290 B. Aquarii	6.3	23 9 55.697	. . . .	11 10 59.58	. . .
ψ^1 Aquarii	4.5	23 11 7.507	+ 0.0250	9 35 0.70	− 0.005
ψ^2 Aquarii	4.6	23 13 10.498	+ 0.0012	9 40 45.58	− 0.002
ψ^3 Aquarii	5.2	23 14 13.726	+ 0.0027	− 10 6 30.34	− 0.001
336 B. Aquarii	6.3	23 24 18.394	. . . .	9 46 0.06	. . .
351 B. Aquarii	6.5	23 30 50.441	− 0.0005	7 58 5.46	+ 0.018
376 B. Aquarii	6.3	23 43 51.962	+ 0.0009	6 53 8.90	− 0.023
30 Piscium	4.7	23 57 17.596	+ 0.0030	− 6 31 11.26	− 0.037

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JANUARY.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1909.0.		Apparent Declination.	Washington Mean Time.	Hour Angle, *H*	*Y*	*x'*	*y'*	N.	S.
		Δα	Δδ								
		s	"	° ′	d h m	h m				°	°
147 B. Arietis	5.8	−0.29	−2.2	+12 50.2	1 8 3.2	− 0 14.1	+0.8803	0.5463	+0.2027	+90	+13
30 B. Tauri	6.4	0.16	1.3	15 7.9	22 24.9	−10 21.3	+1.2623	0.5511	0.1825	+90	+47
33 B. Tauri	6.3	0.15	1.0	16 14.5	23 8.4	− 9 39.3	+0.2347	0.5514	0.1814	+54	−20
148 B. Tauri	5.9	0.10	0.7	17 3.4	2 5 20.4	− 3 39.9	+0.4761	0.5535	0.1715	+71	− 6
162 B. Tauri	6.3	0.07	0.7	17 2.4	8 41.9	− 0 25.3	+1.0609	0.5547	0.1659	+90	+30
163 B. Tauri	5.8	−0.07	−0.5	+17 56.3	8 46.0	− 0 21.4	+0.1303	0.5547	+0.1657	+48	−24
43 Tauri	5.5	0.04	−0.1	19 22.1	12 29.3	+ 3 14.3	−0.7685	0.5560	0.1592	− 3	−71
ω Tauri	4.8	−0.01	+0.1	20 21.3	16 5.5	+ 6 43.0	−1.2448	0.5572	0.1527	−43	−70
85 H'. Tauri	6.0	0.00	−0.3	18 31.5	17 31.0	+ 8 5.6	+0.8971	0.5577	0.1501	+90	+20
224 B. Tauri	6.1	0.00	+0.2	20 36.4	18 21.7	+ 8 54.5	−1.1686	0.5580	0.1485	−34	−69
227 B. Tauri	5.9	+0.01	+0.2	+20 46.2	18 52.4	+ 9 24.1	−1.2654	0.5582	+0.1476	−47	−69
234 B. Tauri	6.0	0.01	−0.2	18 50.0	19 31.6	+10 2.0	+0.8713	0.5584	0.1463	+90	+19
ε Tauri	3.6	0.03	−0.2	18 58.8	21 8.9	+11 35.9	+0.9528	0.5589	0.1432	+90	+25
282 B. Tauri	6.4	0.05	0.0	19 41.7	3 0 16.7	− 9 23.0	+0.6380	0.5600	0.1372	+87	+ 6
129 H'. Tauri	5.8	0.06	+0.2	20 30.1	1 23.6	− 8 18.4	−0.0629	0.5603	0.1350	+37	−31
ι Tauri	4.7	+0.14	+0.3	+21 27.6	12 15.8	+ 2 10.8	+0.2721	0.5634	+0.1127	+57	−11
330 B. Tauri	6.3	0.14	0.3	21 9.0	12 49.4	+ 2 43.3	+0.6633	0.5635	0.1116	+90	+10
105 Tauri	6.0	0.15	0.3	21 35.1	14 22.2	+ 4 12.8	+0.3732	0.5639	0.1082	+64	− 5
108 Tauri	6.2	0.17	0.4	22 10.9	17 38.4	+ 7 22.0	+0.0832	0.5647	0.1012	+45	−20
n Tauri	5.1	0.18	0.4	22 0.2	19 18.0	+ 8 58.1	+0.4377	0.5651	0.0976	+69	− 1
o Tauri	4.8	+0.20	+0.3	+21 51.6	22 55.7	−11 32.0	+0.9303	0.5657	+0.0895	+90	+29
121 Tauri	5.1	0.23	0.6	23 58.8	4 2 16.5	− 8 18.3	−1.0391	0.5663	0.0820	−24	−66
175 H'. Tauri	6.5	0.24	0.4	22 36.9	5 9.6	− 5 31.5	+0.6415	0.5667	0.0755	+89	+13
394 B. Tauri	6.0	0.24	0.4	23 9.7	5 41.6	− 5 0.6	+0.0993	0.5668	0.0742	+46	−16
132 Tauri	5.0	0.26	0.5	24 32.3	8 7.6	− 2 39.8	−1.1952	0.5671	0.0687	−41	−65
412 B. Tauri	5.8	+0.27	+0.5	+24 14.2	11 33.0	+ 0 38.2	−0.6537	0.5673	+0.0608	+ 3	−61
1 Geminorum	4.1	0.28	0.3	23 16.1	14 40.0	+ 3 38.5	+0.5594	0.5676	0.0535	+80	+10
3 Geminorum	5.6	0.29	0.3	23 7.7	17 5.3	+ 5 58.6	+0.8325	0.5676	0.0478	+90	+27
5 Geminorum	5.9	0.30	0.4	24 26.5	17 50.6	+ 6 42.2	−0.5369	0.5676	0.0461	+10	−51
6 Geminorum	6.3	0.30	0.3	22 55.8	18 12.4	+ 7 3.3	+1.0983	0.5676	0.0452	+90	+46
8 Geminorum	6.1	+0.31	+0.3	+24 0.0	19 54.7	+ 8 41.9	+0.0256	0.5676	+0.0412	+42	−17
9 Geminorum	6.2	0.31	0.3	23 46.3	20 12.1	+ 8 58.7	+0.2814	0.5676	0.0405	+58	− 3
36 B. Geminorum	6.0	0.32	0.2	23 22.7	23 54.4	−11 27.0	+0.8389	0.5675	0.0318	+90	+28
52 B. Geminorum	6.5	0.33	0.2	24 40.0	5 5 1.5	− 6 31.0	−0.4134	0.5671	0.0197	+17	−40
ε Geminorum	3.2	0.34	+0.1	25 13.3	7 49.0	− 3 49.4	−0.9654	0.5667	0.0131	−19	−65
87 B. Geminorum	5.8	+0.35	0.0	+23 42.6	11 20.5	− 0 25.5	+0.6942	0.5662	+0.0048	+90	+22
37 Geminorum	5.7	0.35	0.0	25 29.4	12 44.8	+ 0 55.8	−1.2203	0.5660	+0.0014	−46	−65
ω Geminorum	5.2	0.36	−0.1	24 20.7	15 51.2	+ 3 55.5	+0.0065	0.5654	−0.0058	+40	−15
48 Geminorum	5.8	0.36	0.2	24 16.9	20 13.6	+ 8 8.6	+0.0282	0.5643	0.0160	+42	−14
52 Geminorum	6.1	0.37	0.2	25 2.6	21 11.9	+ 9 4.9	−0.8126	0.5641	0.0183	− 8	−65
A Geminorum	5.1	+0.37	−0.3	+25 13.6	6 1 2.8	−11 12.4	−1.0984	0.5630	−0.0272	−30	−65
58 Geminorum	6.0	0.36	0.3	23 7.3	1 4.7	−11 10.6	+1.1797	0.5630	0.0272	+90	+54
B.D.+23°,1744	6.4	0.36	0.4	23 4.9	5 12.3	− 7 11.7	+1.0915	0.5616	0.0366	+90	+46
176 B. Geminorum	6.3	0.36	0.5	24 33.9	7 33.8	− 4 55.2	−0.6086	0.5608	0.0419	+ 6	−56
181 B. Geminorum	6.0	0.36	0.5	24 25.7	7 59.4	− 4 30.5	−0.4798	0.5606	0.0429	+13	−47
187 B. Geminorum	6.3	+0.36	−0.5	+23 13.8	8 47.9	− 3 43.7	+0.7864	0.5603	−0.0447	+90	+24
κ Geminorum	3.6	0.36	0.6	24 37.0	10 19.0	− 2 15.8	−0.7898	0.5597	0.0481	− 6	−65
82 Geminorum	6.3	0.36	0.6	23 22.0	12 9.9	− 0 28.7	+0.4754	0.5591	0.0521	+72	+ 6
5 B. Cancri	6.4	0.35	0.8	23 50.0	17 43.6	+ 4 53.4	−0.3561	0.5567	0.0642	+20	−41
9 Cancri	6.2	0.34	0.8	22 53.7	20 7.4	+ 7 12.3	+0.5054	0.5556	0.0693	+74	+ 6
35 B. Cancri	6.4	+0.34	−0.9	+23 24.7	23 27.5	+10 25.6	−0.3001	0.5540	−0.0763	+23	−38
γ Cancri	4.9	0.30	1.1	21 47.8	7 13 4.1	− 0 25.3	+0.2399	0.5470	0.1034	+55	−12
90 H'. Cancri	6.1	0.24	1.4	21 39.5	8 3 22.7	−10 34.7	−1.2771	0.5388	0.1290	−50	−68
57 B. Leonis	6.5	0.15	1.4	19 16.9	18 25.9	+ 3 59.9	−0.7885	0.5300	0.1526	− 4	−71
107 B. Leonis	6.3	0.08	1.0	16 12.0	9 5 3.4	− 9 42.1	+0.9129	0.5238	0.1672	+90	+18
η Leonis	3.6	+0.08	−1.2	+17 12.4	5 52.6	− 8 54.4	−0.3362	0.5234	−0.1682	+22	−51

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JANUARY.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1909.0.		Apparent Declination.	Washington Mean Time.	Hour Angle, *H*	*Y*	*x′*	*y′*	N.	S.
		Δα	Δδ								
		s	″	° ′	d h m	h m				°	°
42 Leonis	6.1	+0.02	− 1.0	+15 26.1	**9** 13 17.6	− 1 42.7	+0.3418	0.5193	−0.1772	+61	−16
46 Leonis	5.8	−0.01	0.9	14 36.3	18 39.0	+ 3 29.2	+0.2951	0.5166	0.1833	+58	−18
k Leonis	5.5	0.07	1.0	14 40.5	**10** 2 5.2	+10 42.2	−1.1754	0.5129	0.1909	−31	−75
ι Leonis	4.1	0.23	− 0.3	11 1.8	22 7.5	+ 6 10.2	−1.1361	0.5048	0.2075	−26	−79
ω Virginis	5.4	0.30	+ 0.2	8 38.3	**11** 6 3.1	−10 7.4	−0.1479	0.5024	0.2126	+32	−46
ξ Virginis	4.8	−0.33	+ 0.1	+ 8 45.8	9 47.0	− 6 29.7	−1.0848	0.5014	−0.2147	−22	−81
ν Virginis	4.2	0.33	0.6	7 2 4	10 6.3	− 6 10.9	+0.7579	0.5013	0.2148	+90	+ 2
A′ Virginis	5.1	0.34	0.1	8 45.1	11 14.0	− 5 5.1	−1.3825	0.5011	0.2154	−62	−81
π Virginis	4.6	0.40	0.5	7 7.3	18 21.8	+ 1 50.9	−1.1244	0.4997	0.2188	−25	−83
36 B. Virginis	6.5	0.42	0.8	6 4.0	19 57.3	+ 3 23.8	−0.3044	0.4994	0.2195	+24	−57
11 Virginis	5.6	−0.45	+ 0.7	+ 6 18 8	23 26.8	+ 6 47.6	−1.3456	0.4990	−0.2209	−49	−84
c Virginis	5.1	0.50	1.4	3 49.2	**12** 5 8.9	−11 39.8	+0.1500	0.4984	0.2227	+49	−32
250 B. Virginis	5.9	0.60	1.7	+ 2 21.4	15 7.2	− 1 57.8	−0.4657	0.4982	0.2251	+16	−68
80 Virginis	5.6	0.92	3.5	− 4 55.9	**13** 22 27 2	+ 4 30.2	+0.4761	0.5037	0.2242	+68	−15
566 B. Virginis	6.4	0.96	3.4	5 2.4	**14** 2 58.6	+ 8 54.0	−0.4173	0.5053	0.2230	+17	−65
88 Virginis	6.5	−0.99	+ 3.8	− 6 23.0	5 19.4	+11 10.9	+0.5259	0.5062	−0.2223	+72	−12
598 B. Virginis	6.1	1.03	4.1	7 36.6	8 52.8	− 9 21.8	+1.0744	0.5077	0.2210	+82	+21
623 B. Virginis	6.5	1.08	4.4	8 49.2	13 50.2	− 4 32.9	+1.2972	0.5100	0.2189	+81	+42
95 Virginis	5.4	1.10	4.3	8 52.7	15 4.9	− 3 20.4	+1.0885	0.5106	0.2183	+81	+22
6 B. Libræ	6.2	1.28	4.7	11 55.0	**15** 6 45.5	+11 52.5	+1.0136	0.5195	0.2090	+78	+17
22 B. Libræ	6.4	−1.34	+ 4.6	−12 27.4	12 13.0	− 6 49.9	+0.4617	0.5231	−0.2047	+63	−16
13 Libræ	5.7	1.36	4.1	11 31.6	15 27.8	− 3 41.1	−1.1957	0.5254	0.2019	−36	−90
ο Libræ	6.2	1.53	4.5	15 13 2	**16** 4 25.2	+ 8 52.0	+0.2182	0.5353	0.1889	+46	−28
32 Libræ	5.9	1.57	4.7	16 23.9	7 51.2	−11 48.6	+0.8290	0.5381	0.1849	+74	+ 6
34 Libræ	6.0	1.58	4.6	16 17.8	9 0.0	−10 42.0	+0.5090	0.5391	0.1835	+63	−13
ζ Libræ	5.6	−1.60	+ 4.6	−16 32.6	10 3.5	− 9 40.6	+0.5774	0.5400	−0.1822	+67	− 9
θ Libræ	4.4	1.70	3.8	16 27.7	19 45.8	− 0 17.6	−1.2133	0.5483	0.1691	−43	−90
β^1 Scorpii	2.9	1.79	4.3	19 33.3	**17** 0 59.1	+ 4 45.1	+1.1804	0.5530	0.1611	+70	+34
56 B. Scorpii	5.0	1.79	4.3	19 33.1	0 59.3	+ 4 45.3	+1.1758	0.5530	0.1611	+70	+34
73 B. Scorpii	6.4	1.79	3.7	18 5.9	3 1 3	+ 6 43.1	−0.6752	0.5548	0.1579	− 6	−90
ν Scorpii	3.9	−1.81	+ 3.9	−19 13.4	3 55.6	+ 7 35.4	+0.3634	0.5557	−0.1564	+50	−20
88 B. Scorpii	6.4	1.82	3.5	18 18.1	5 7.6	+ 8 44.9	−0.7896	0.5567	0.1544	−13	−90
58 G. Scorpii	6.2	1.85	3.8	19 59.7	7 4.6	+10 37.9	+0.6860	0.5585	0.1511	+69	− 2
ψ Ophiuchi	4.6	1.87	3.5	19 49.4	9 16.1	−11 15.2	+0.1791	0.5605	0.1473	+38	−30
ω Ophiuchi	4.5	1.92	3.6	21 16.3	12 44.7	− 7 54.0	+1.1869	0.5637	0.1410	+69	+36
123 B. Scorpii	6.5	−1.95	+ 2.9	−20 13.8	16 24.0	− 4 22.6	−0.4001	0.5670	−0.1341	+ 6	−65
131 B. Scorpii	5.5	1.95	2.7	19 45.0	16 58.3	− 3 49.5	−0.9764	0.5675	0.1330	−28	−90
68 B. Ophiuchi	5.9	2.00	2.3	20 15.8	21 51.7	+ 0 53.2	−1.0667	0.5719	0.1232	−36	−90
116 B. Ophiuchi	6.3	2.06	2.0	21 26.3	**18** 3 11.0	+ 6 0.6	−0.4743	0.5766	0.1119	0	−72
51 Ophiuchi	4.8	2.19	1.3	23 53.6	13 27.5	− 8 6.3	+1.0185	0.5852	0.0883	+66	+22
52 Ophiuchi	6.4	−2.17	+ 0.7	−21 59.0	15 3.4	− 6 34.1	−1.0774	0.5864	−0.0845	−40	−90
4 Sagittarii	4.8	2.26	− 0.3	23 48.5	**19** 0 44.9	+ 2 44.6	+0.0890	0.5934	0.0600	+25	−35
21 G. Sagittarii	5.7	2.25	0.5	22 46.7	1 35.7	+ 3 33.4	−1.0089	0.5940	0.0578	−38	−90
7 Sagittarii	5.5	2.28	0.4	24 16.9	1 56.4	+ 3 53.3	+0.5014	0.5943	0.0568	+49	−12
9 Sagittarii	6.0	2.28	0.4	24 21.8	2 20.4	+ 4 16.3	+0.5613	0.5945	0.0558	+53	− 8
1 Sagittarii	5.2	−2.29	− 0.9	−23 43.2	5 24.7	+ 7 13.3	−0.2510	0.5964	−0.0476	+ 5	−56
				NEW	*MOON.*						
56 Aquarii	6.1	1.91	12.2	15 3.3	**23** 9 11.4	+ 6 57.1	+0.0600	0.5801	+0.2050	+37	−37
69 Aquarii	5.6	1.84	12.5	14 32.4	16 25.8	−10 4.8	+1.0752	0.5753	0.2155	+75	+22
τ Aquarii	4.4	−1.83	−12.5	−14 4.6	17 13.3	− 9 19.0	+0.7883	0.5748	+0.2166	+76	+ 3
74 Aquarii	5.8	1.80	12.2	12 6.2	18 51.7	− 7 44.3	−0.8049	0.5737	0.2187	− 8	−90
257 B. Aquarii	6.3	1.78	12.6	13 33.7	21 26.3	− 5 15.4	+1.2047	0.5720	0.2219	+76	+33
290 B. Aquarii	6.3	1.71	12.3	11 11 2	**24** 3 52.3	+ 0 56.5	+0.3057	0.5680	0.2291	+54	−24
ψ^1 Aquarii	4.5	1.70	11.9	9 35.2	4 23.0	+ 1 26.1	−1.1618	0.5677	0.2296	−31	−90
ψ^2 Aquarii	4.6	−1.69	−12.0	− 9 41.0	5 15.8	+ 2 17.1	−0.8647	0.5671	+0.2305	−10	−90

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JANUARY.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1909.0.		Apparent Declination.	Washington Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
		Δα	Δδ								
		s	"	° '	d h m	h m				°	°
ψ^3 Aquarii	5.2	−1.69	−12.1	−10 6.7	**24** 5 43.0	+ 2 43.2	−0.3349	0.5669	+0.2310	+20	−60
336 B. Aquarii	6.3	1.64	12.1	9 46.2	10 4.1	+ 6 55.0	+0.3401	0.5643	0.2349	+57	−22
351 B. Aquarii	6.5	1.61	11.7	7 58.3	12 54.6	+ 9 39.4	−0.7745	0.5626	0.2372	− 3	−90
376 B. Aquarii	6.3	1.55	11.5	6 53.3	18 37.4	− 8 49.8	−0.4846	0.5595	0.2412	+13	−70
30 Piscium	4.7	1.48	11.4	6 31.4	**25** 0 34.5	− 3 5.3	+0.5965	0.5564	0.2444	+77	− 9
33 Piscium	4.7	−1.47	−11.4	− 6 13.2	2 5.1	− 1 37.9	+0.6642	0.5557	+0.2451	+82	− 5
24 B. Ceti	6.0	1.44	11.3	5 45.4	4 18.7	+ 0 31.2	+0.7499	0.5546	0.2459	+84	0
54 B. Ceti	6.3	1.38	10.4	2 43.5	10 42.2	+ 6 41.6	−0.7021	0.5519	0.2477	+ 3	−90
14 Ceti	5.4	1.32	9.8	− 1 0.5	15 42.7	+11 31.8	−1.1812	0.5500	0.2485	−29	−90
26 Ceti	6.0	1.19	9.0	+ 0 52.6	**26** 4 40.6	+ 0 3.7	+0.1400	0.5461	0.2476	+48	−33
33 Ceti	6.1	−1.16	− 8.6	+ 1 57.6	7 47.6	+ 3 4.4	−0.1820	0.5454	+0.2468	+30	−50
f Piscium	5.1	1.12	8.1	3 8.0	11 8.6	+ 6 18.7	−0.5444	0.5447	0.2457	+12	−74
117 G. Piscium	6.5	1.07	8.1	3 3.7	15 21.7	+10 23.4	+0.5614	0.5440	0.2440	+76	−10
ν Piscium	4.6	1.01	7.2	5 1.5	22 7.0	− 7 4.7	+0.2051	0.5432	0.2405	+52	−29
39 B. Arietis	6.5	0.89	6.1	7 17.9	**27** 9 0.9	+ 3 27.7	+0.4707	0.5428	0.2328	+69	−14
64 Ceti	5.8	−0.86	− 5.7	+ 8 8.6	12 2.8	+ 6 23.6	+0.3086	0.5428	+0.2303	+58	−22
ξ^1 Ceti	4.5	0.85	5.6	8 25.1	12 48.4	+ 7 7.6	+0.2008	0.5429	0.2296	+52	−28
ξ Arietis	5.5	0.80	4.8	10 11.8	18 17.5	−11 34.1	−0.3790	0.5432	0.2245	+20	−59
25 Arietis	6.5	0.78	4.9	9 47.6	19 30.5	−10 23.5	+0.3086	0.5433	0.2233	+58	−21
389 B. Ceti	6.3	0.77	5.1	9 9.5	20 31.4	− 9 24.6	+1.1886	0.5434	0.2223	+90	+33
31 Arietis	5.7	−0.74	− 4.0	+12 3.1	23 45.2	− 6 17.3	−1.0786	0.5437	+0.2189	−22	−78
85 Ceti	6.3	0.71	4.5	10 21.2	**28** 2 30.1	− 3 37.8	+1.2713	0.5441	0.2158	+90	+43
38 Arietis	5.2	0.70	3.9	12 3.7	3 37.5	− 2 32.6	−0.2510	0.5442	0.2145	+27	−50
147 B. Arietis	5.8	0.59	3.3	12 50.1	13 32.0	+ 7 2.1	+1.0162	0.5459	0.2022	+90	+22
33 B. Tauri	6.3	0.42	1.7	16 14.4	**29** 4 37.4	− 2 22.9	+0.3648	0.5493	0.1802	+62	−13
148 B. Tauri	5.9	−0.35	− 1.2	+17 3.4	10 50.8	+ 3 37.8	+0.6026	0.5509	+0.1701	+82	0
162 B. Tauri	6.3	0.31	1.2	17 2.4	14 13.4	+ 6 53.5	+1.1858	0.5517	0.1643	+90	+41
163 B. Tauri	5.8	0.31	0.9	17 56.2	14 17.6	+ 6 57.5	+0.2542	0.5517	0.1642	+55	−18
43 Tauri	5.5	0.27	− 0.3	19 22.1	18 2.3	+10 34.6	−0.6487	0.5528	0.1576	+ 4	−68
ω Tauri	4.8	0.23	+ 0.1	20 21.3	21 40.0	− 9 55.1	−1.1290	0.5537	0.1510	−29	−70
85 H'. Tauri	6.0	−0.21	− 0.5	+18 31.5	23 6.2	− 8 31.9	+1.0160	0.5541	+0.1483	+90	+28
224 B. Tauri	6.1	0.21	+ 0.2	20 36.4	23 57.3	− 7 42.6	−1.0549	0.5543	0.1468	−23	−69
227 B. Tauri	5.9	0.20	+ 0.2	20 46.2	**30** 0 28.2	− 7 12.7	−1.1524	0.5544	0.1458	−32	−69
234 B. Tauri	6.0	0.19	− 0.4	18 50.0	1 7.8	− 6 34.4	+0.9886	0.5546	0.1445	+90	+27
ε Tauri	3.6	0.17	− 0.3	18 58.7	2 45.9	− 4 59.7	+1.0691	0.5550	0.1415	+90	+33
282 B. Tauri	6.4	−0.14	0.0	+19 41.7	5 55.5	− 1 56.7	+0.7511	0.5558	+0.1354	+90	+13
129 H'. Tauri	5.8	0.13	+ 0.2	20 30.2	7 3.0	− 0 51.5	+0.0472	0.5561	0.1331	+43	−25
ι Tauri	4.7	−0.01	0.6	21 27.6	18 2.2	+ 9 44.7	+0.3733	0.5587	0.1108	+64	− 5
330 B. Tauri	6.3	0.00	0.5	21 9.1	18 36.2	+10 17.6	+0.7655	0.5588	0.1097	+90	+16
105 Tauri	6.0	+0.02	0.6	21 35.1	20 10.1	+11 48.1	+0.4728	0.5591	0.1064	+72	0
108 Tauri	6.2	+0.05	+ 0.8	+22 10.9	23 28.7	− 9 0.2	+0.1783	0.5598	+0.0993	+51	−14
n Tauri	5.1	0.07	0.8	22 0.2	**31** 1 9.6	− 7 22.9	+0.5326	0.5601	0.0957	+77	+ 5
o Tauri	4.8	0.11	0.7	21 51.6	4 50.1	− 3 50.2	+1.0237	0.5607	0.0877	+90	+36
121 Tauri	5.1	0.15	1.3	23 58.8	8 13.5	− 0 33.9	−0.9585	0.5612	0.0802	−17	−66
175 H'. Tauri	6.5	0.18	0.9	22 37.0	11 8.9	+ 2 15.2	+0.7269	0.5616	0.0737	+90	+18
394 B. Tauri	6.0	+0.18	+ 1.0	+23 9.7	11 41.4	+ 2 46.6	+0.1815	0.5616	+0.0725	+51	−12
132 Tauri	5.0	0.21	1.4	24 32.3	14 9.3	+ 5 9.3	−1.1221	0.5619	0.0669	−32	−65
412 B. Tauri	5.8	0.25	1.2	24 14.2	17 37.5	+ 8 30.1	−0.5819	0.5622	0.0591	+ 7	−55
1 Geminorum	4.1	0.27	1.0	23 16.1	20 47.1	+11 33.0	+0.6338	0.5624	0.0519	+88	+14
3 Geminorum	5.6	0.29	0.9	23 7.8	23 14.5	−10 4.8	+0.9055	0.5625	0.0462	+90	+31

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Name.	Mag.	Δα	Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
5 Geminorum	5.9	+0.30	+ 1.2	+24 26.5	**1** 0 0.4	− 9 20.6	−0.4720	0.5625	+0.0445	+13	−46
6 Geminorum	6.3	0.30	0.8	22 55.8	0 22.5	− 8 59.2	+1.1714	0.5625	0.0436	+90	+52
8 Geminorum	6.1	+0.32	+ 1.1	+24 0.0	2 6.3	− 7 19.2	+0.0910	0.5625	+0.0396	+46	−13

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

FEBRUARY.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1909.0		Apparent Declination.	Washington Mean Time.	Hour Angle, *H*	*Y*	*x′*	*y′*	N.	S.
		Δα	Δδ								
		s	"	° '	d h m	h m				°	°
9 Geminorum	6.2	+0.32	+1.0	+23 46.4	1 2 23.8	− 7 2.2	+0.3478	0.5625	+0.0389	+63	0
36 B. Geminorum	6.0	0.35	0.8	23 22.7	6 9.2	− 3 24.8	+0.9036	0.5625	0.0303	+90	+33
52 B. Geminorum	6.5	0.40	1.0	24 40.0	11 20.6	+ 1 35.6	−0.3617	0.5622	0.0182	+20	−37
ε Geminorum	3.2	0.43	1.0	25 13.3	14 10.4	+ 4 19.4	−0.9202	0.5620	0.0117	−15	−65
87 B. Geminorum	5.8	0.45	0.6	23 42.6	17 44.8	+ 7 46.2	+0.7438	0.5616	0.0034	+90	+25
37 Geminorum	5.7	+0.47	+0.9	+25 29.4	19 10.2	+ 9 8.6	−1.1829	0.5614	+0.0001	−41	−65
ω Geminorum	5.2	0.49	0.6	24 20.8	22 19.0	−11 49.2	+0.0464	0.5609	−0.0071	+43	−13
48 Geminorum	5.8	0.52	0.5	24 16.9	2 2 44.8	− 7 32.6	+0.0624	0.5600	0.0173	+44	−13
52 Geminorum	6.1	0.53	0.5	25 2.6	3 43.8	− 6 35.7	−0.7841	0.5598	0.0195	− 6	−65
A Geminorum	5.1	0.55	0.4	25 13.6	7 37.5	− 2 50.1	−1.0766	0.5589	0.0283	−28	−65
58 Geminorum	6.0	+0.54	+0.1	+23 7.3	17 39.4	− 2 48.3	+1.2131	0.5589	−0.0284	+90	+58
B.D.+23°, 1744	6.4	0.57	0.0	23 4.9	11 50.0	+ 1 13.5	+1.1186	0.5578	0.0378	+90	+48
176 B. Geminorum	6.3	0.59	0.1	24 33.9	14 13.1	+ 3 31.7	−0.5933	0.5571	0.0430	+ 6	−55
181 B. Geminorum	6.0	0.59	+0.1	24 25.8	14 39.0	+ 3 56.7	−0.4645	0.5570	0.0440	+14	−46
187 B. Geminorum	6.3	0.59	−0.1	23 13.8	15 28.0	+ 4 44.0	+0.8068	0.5568	0.0458	+90	+25
κ Geminorum	3.6	+0.60	0.0	+24 37.0	17 0.1	+ 6 12.9	−0.7791	0.5562	−0.0492	− 5	−65
82 Geminorum	6.3	0.60	−0.2	23 22.0	18 52.3	+ 8 1.3	+0.4894	0.5556	0.0532	+74	+ 6
5 B. Cancri	6.4	0.63	0.4	23 50.0	3 0 29.5	−10 33.1	−0.3540	0.5537	0.0653	+20	−41
9 Cancri	6.2	0.64	0.6	22 53.7	2 54.6	− 8 12.9	+0.5077	0.5527	0.0705	+75	+ 6
35 B. Cancri	6.4	0.65	0.7	23 24.7	6 16.6	− 4 57.8	−0.3061	0.5514	0.0774	+23	−39
γ Cancri	4.9	+0.68	−1.4	+21 47.8	19 59.4	+ 8 18.1	+0.2153	0.5452	−0.1046	+53	−13
57 B. Leonis	6.5	0.68	2.7	19 16.9	5 1 30.2	−11 8.3	−0.8627	0.5299	0.1542	− 9	−71
107 B. Leonis	6.3	0.65	2.9	16 12.0	12 9.0	− 0 49.0	+0.8253	0.5243	0.1689	+90	+12
η Leonis	3.6	0.65	3.0	17 12.4	12 58.3	− 0 1.2	−0.4278	0.5239	0.1699	+17	−57
42 Leonis	6.1	0.62	3.2	15 26.0	20 23.8	+ 7 11.0	+0.2395	0.5201	0.1791	+54	−21
46 Leonis	5.8	+0.60	−3.3	+14 36.2	6 1 45.4	−11 36.9	+0.1841	0.5175	−0.1851	+51	−24
k Leonis	5.5	0.58	3.6	14 40.5	9 11.7	− 4 23.6	−1.3009	0.5141	0.1928	−46	−75
ι Leonis	4.1	0.48	3.8	11 1.8	7 5 13.9	− 8 55.7	−1.2926	0.5061	0.2094	−42	−79
ω Virginis	5.4	0.42	3.6	8 38.2	13 9.5	− 1 13.4	−0.3139	0.5035	0.2144	+24	−56
ξ Virginis	4.8	0.40	3.7	8 45.8	16 53.5	+ 2 24.4	−1.2582	0.5025	0.2164	−37	−81
ν Virginis	4.2	+0.39	−3.4	+ 7 2.3	17 12.9	+ 2 43.2	+0.5885	0.5024	−0.2166	+79	− 8
π Virginis	4.6	0.35	3.6	7 7.2	8 1 28.9	+10 45.5	−1.3099	0.5005	0.2204	−43	−83
36 B. Virginis	6.5	0.33	3.4	6 3.9	3 4.6	−11 41.4	−0.4897	0.5001	0.2211	+14	−69
c Virginis	5.1	0.27	3.1	3 49.1	12 17.4	− 2 43.7	−0.0451	0.4987	0.2240	+38	−42
250 B. Virginis	5.9	+0.20	3.0	+ 2 21.3	22 18.0	+ 7 0.6	−0.6742	0.4980	0.2260	+ 5	−86
65 Virginis	6.0	−0.01	−1.6	− 4 26.9	9 23 11.1	+ 7 12.9	+1.2194	0.4998	−0.2253	+86	+32
66 Virginis	5.7	0.02	1.6	4 41.3	23 51.4	+ 7 52.1	+1.3329	0.4999	0.2252	+85	+46
80 Virginis	5.6	0.07	1.6	4 56.0	10 5 52.8	−10 16.5	+0.2483	0.5013	0.2238	+54	−27
566 B. Virginis	6.4	0.11	1.7	5 2.5	10 27.4	− 5 49.6	−0.6537	0.5025	0.2224	+ 5	−85
88 Virginis	6.5	0.13	1.3	6 23.0	12 50.0	− 3 30.9	+0.2957	0.5032	0.2215	+56	−25
598 B. Virginis	6.1	−0.17	−1.0	− 7 36.7	16 26.4	− 0 0.6	+0.8476	0.5044	−0.2201	+82	+ 6
623 B. Virginis	6.5	0.21	0.7	8 49.2	21 28.2	+ 4 52.7	+1.0715	0.5063	0.2178	+81	+20
95 Virginis	5.4	0.23	0.7	8 52.8	22 44.1	+ 6 6.4	+0.8605	0.5067	0.2171	+81	+ 6
κ Virginis	4.2	0.26	0.5	9 51.0	11 2 0.7	+ 9 17.5	+1.2138	0.5081	0.2153	+80	+33
6 B. Libræ	6.2	0.39	0.1	11 55.1	14 41.5	− 2 23.7	+0.7859	0.5143	0.2070	+78	+ 2
22 B. Libræ	6.4	−0.44	−0.1	−12 27.4	20 15.7	+ 3 0.6	+0.2294	0.5174	−0.2026	+49	−28
o Libræ	6.2	0.62	+0.3	15 13.2	12 12 50.0	− 4 55.4	−0.0105	0.5282	0.1862	+33	−41
32 Libræ	5.9	0.67	0.6	16 24.0	16 21.2	− 1 30.8	+0.6096	0.5308	0.1821	+69	− 7
34 Libræ	6.0	0.68	0.5	16 17.8	17 31.6	− 0 22.6	+0.2866	0.5316	0.1807	+49	−25
ζ Libræ	5.6	0.69	0.6	16 32.7	18 36.8	+ 0 40.5	+0.3564	0.5324	0.1794	+53	−21
47 Libræ	5.8	−0.82	+1.0	−19 6.9	13 5 5.2	+10 48.7	+1.2950	0.5406	−0.1653	+71	+50
β^1 Scorpii	2.9	0.88	0.9	19 33.4	9 56.1	− 8 30.0	+0.9788	0.5445	0.1581	+70	+17
56 B. Scorpii	5.0	0.88	0.9	19 33.2	9 56.3	− 8 29.8	+0.9742	0.5445	0.1581	+70	+16
73 B. Scorpii	6.4	0.90	0.3	18 5.9	12 1.6	− 6 28.7	−0.8986	0.5463	0.1548	−20	−90
ν Scorpii	3.9	0.91	0.6	19 13.5	12 57.4	− 5 34.8	+0.1543	0.5471	0.1533	+38	−32
88 B. Scorpii	6.4	−0.92	+0.3	−18 18.2	14 11.5	− 4 23.2	−1.0125	0.5481	−0.1513	−28	−90

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

FEBRUARY.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1909.0.		Apparent Declination.	Washington Mean Time.	Hour Angle. H	Y	x'	y'	N.	S.
		Δα	Δδ								
		s	"	° ′	d h m	h m				°	°
58 G. Scorpii	6.2	−0.95	+ 0.7	−19 59.8	**13** 16 11.7	− 2 27.0	+0.4841	0.5498	−0.1480	+57	−14
ψ Ophiuchi	4.6	0.98	0.6	19 49.5	18 26.9	− 0 16.5	−0.0271	0.5516	0.1442	+27	−42
ω Ophiuchi	4.5	1.03	0.9	21 16.3	22 1.2	+ 3 10.5	+0.9973	0.5547	0.1380	+69	+19
123 B. Scorpii	6.5	1.07	0.2	20 13.9	**14** 1 46.7	+ 6 48.1	−0.6060	0.5579	0.1311	− 5	−84
131 B. Scorpii	5.5	1.07	+ 0.1	19 45.0	2 22.0	+ 7 22.2	−1.1890	0.5584	0.1300	−45	−90
68 B. Ophiuchi	5.9	−1.13	− 0.1	−20 15.8	7 23.6	−11 46.9	−1.2744	0.5627	−0.1203	−58	−90
116 B. Ophiuchi	6.3	1.20	− 0.1	21 26.3	12 51.8	− 6 30.5	−0.6677	0.5673	0.1091	−11	−90
b Ophiuchi	4.4	1.32	+ 0.2	24 5.5	21 19.1	+ 1 38.1	+1.2510	0.5743	0.0906	+66	+49
51 Ophiuchi	4.8	1.35	− 0.1	23 53.6	23 25.1	+ 3 39.4	+0.8573	0.5760	0.0858	+66	+10
52 Ophiuchi	6.4	1.35	− 0.8	21 59.0	**15** 1 3.6	+ 5 14.2	−1.2609	0.5772	0.0819	−60	−90
Mars	. .	. . .	. .	−23 22.4	3 35.2	+ 7 40.0	−0.0202	0.5512	−0.0742	+20	−42
63 Ophiuchi	6.1	−1.46	− 0.6	24 52.2	9 0.6	−11 7.0	+1.1475	0.5833	0.0627	+65	+35
4 Sagittarii	4.8	1.47	1.1	23 48.5	11 0.0	− 9 12.2	−0.0661	0.5847	0.0577	+16	−44
21 G. Sagittarii	5.7	1.47	1.5	22 46.7	11 52.1	− 8 22.1	−1.1744	0.5853	0.0555	−52	−90
7 Sagittarii	5.5	1.49	1.0	24 16.9	12 13.3	− 8 1.7	+0.3526	0.5855	0.0546	+39	−20
9 Sagittarii	6.0	−1.50	− 1.1	−24 21.8	12 37.8	− 7 38.2	+0.4137	0.5859	−0.0536	+43	−17
1 Sagittarii	5.2	1.52	1.6	23 43.2	15 46.6	− 4 36.7	−0.4022	0.5879	0.0455	− 3	−66
70 B. Sagittarii	6.4	1.57	1.5	24 57.4	19 38.6	− 0 53.9	+0.7078	0.5904	0.0353	+64	0
λ Sagittarii	2.9	1.61	1.7	25 28.4	22 10.7	+ 1 32.2	+1.1528	0.5919	0.0285	+65	+36
24 Sagittarii	5.7	1.61	2.3	24 6 1	**16** 0 31.3	+ 3 47.3	−0.3072	0.5932	0.0222	0	−60
117 B. Sagittarii	5.8	−1.62	− 2.6	−23 35.0	2 20.2	+ 5 31.9	−0.8698	0.5943	−0.0172	−32	−90
26 Sagittarii	6.1	1.64	2.6	23 55.2	3 38.1	+ 6 46.6	−0.5476	0.5949	0.0137	−13	−79
126 B. Sagittarii	5.7	1.66	2.4	25 6.2	4 46.3	+ 7 52.1	+0.6432	0.5955	−0.0105	+57	− 3
154 B. Sagittarii	5.9	1.68	3.3	23 17.5	9 8.1	−11 56.7	−1.2156	0.5976	+0.0016	−60	−90
102 B. Sagittarii	6.4	1.71	3.0	25 0.0	10 0.4	−11 6.5	+0.5185	0.5979	0.0041	+46	−11
127 G. Sagittarii	6.4	−1.72	− 3.1	−25 4.2	10 48.2	−10 20.6	+0.5939	0.5982	+0.0063	+52	− 6
172 B. Sagittarii	5.8	1.72	3.2	24 58.4	11 35.9	− 9 34.9	+0.5019	0.5986	0.0086	+45	−12
189 B. Sagittarii	6.1	1.74	3.5	24 48.1	13 49.4	− 7 26.8	+0.3526	0.5994	0.0149	+36	−20
191 B. Sagittarii	6.5	1.72	3.9	23 20.1	14 2.3	− 7 14.4	−1.1252	0.5995	0.0155	−50	−90
ψ Sagittarii	4.8	1.77	3.6	25 24.9	16 36.6	− 4 46.4	+1.0242	0.6004	0.0228	+65	+23
208 B. Sagittarii	6.1	−1.75	− 3.9	−24 20.2	16 37.8	− 4 45.3	−0.0641	0.6004	+0.0229	+13	−44
χ Sagittarii	4.9	1.79	4.2	24 41.2	20 20.7	− 1 11.5	+0.3937	0.6014	0.0335	+40	−18
49 Sagittarii	5.5	1.78	4.3	24 8.5	20 26.4	− 1 6.0	−0.1512	0.6015	0.0337	+ 9	−49
51 Sagittarii	5.8	1.82	4.6	24 55.2	**17** 0 26.6	+ 2 44.3	+0.7878	0 6024	0.0452	+65	+ 6
h Sagittarii	4.7	1.82	4.6	25 5.2	0 41.8	+ 2 58.9	+0.9661	0.6025	0.0459	+65	+18
53 Sagittarii	6.3	−1.81	− 5.0	−23 38.2	1 54.4	+ 4 8.5	−0.4310	0.6027	+0.0494	− 4	−69
274 B. Sagittarii	6.1	1.82	5.0	23 38.4	2 1.1	+ 4 14.9	−0.4227	0.6027	0.0497	− 4	−68
308 B. Sagittarii	6 3	1.85	5.5	24 10.2	7 24.3	+ 9 24.8	+0.4175	0.6034	0.0651	+44	−17
329 B. Sagittarii	6.1	1.85	6.0	22 59.4	10 6.8	−11 59.4	−0.5744	0.6036	0.0728	−10	−81
336 B. Sagittarii	6.5	1.85	6.1	22 51.2	11 0.3	−11 8.1	−0.6445	0.6036	0.0753	−13	−90
4 Capricorni	5.7	−1.87	− 6.8	−22 5.6	16 26.2	− 5 55.6	−0.9482	0.6035	+0.0906	−30	−90
				NEW	*MOON.*						
54 B. Ceti	6.3	1.58	11.1	2 43.5	**21** 20 9.3	− 6 3.3	−0.5191	0.5620	0.2542	+13	−73
14 Ceti	5.4	1.55	10.7	− 1 0.5	**22** 0 59.4	− 1 23.4	−0.9804	0.5603	0.2549	−14	−90
26 Ceti	6.0	−1.46	−10.0	+ 0 52.6	13 29.6	+10 40.5	+0.3407	0.5566	+0.2539	+60	−22
33 Ceti	6.1	1.44	9.7	1 57.5	16 29 9	−10 25.5	+0.0291	0.5559	0.2531	+42	−39
f Piscium	5.1	1.42	9.3	3 8.0	19 43.6	− 7 18 5	−0.3220	0.5552	0.2519	+23	−59
117 G. Piscium	6.5	1.39	9.2	3 3.7	23 47.5	− 3 23.0	+0.7704	0.5545	0.2500	+90	+ 1
ν Piscium	4.6	1.34	8.4	5 1.6	**23** 6 18.1	+ 2 54 2	+0.4290	0.5536	0.2463	+66	−17
39 B. Arietis	6.5	−1.25	− 7.4	+ 7 17.8	16 48.7	−10 56.7	+0.7018	0.5527	+0.2380	+90	− 2
64 Ceti	5.8	1.23	7.0	8 8.5	19 44.3	− 8 7.2	+0.5453	0.5526	0.2353	+75	−10
ξ¹ Ceti	4.5	1.22	6.9	8 25.1	20 28.3	− 7 24.7	+0.4399	0.5525	0.2346	+67	−15
ξ Arietis	5.5	1.18	6.1	10 11.8	**24** 1 46.3	− 2 17.6	−0.1261	0.5525	0.2291	+34	−44
25 Arietis	6.5	1.17	6.2	9 47.6	2 56.8	− 1 9.5	+0.5513	0.5526	0.2279	+76	− 9
31 Arietis	5.7	−1.14	− 5.3	+12 3.1	7 3.2	+ 2 48.5	−0.8115	0.5527	+0.2231	− 4	−78

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

FEBRUARY.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1909.0.		Apparent Declination.	Washington Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
		Δα	Δδ								
		s	"	° '	d h m	h m				°	°
38 Arietis	5.2	−1.10	−5.1	+12 3.7	24 10 48.0	+ 6 25.5	+0.0051	0.5529	+0.2185	+41	−36
147 B. Arietis	5.8	1.00	4.4	12 50.1	20 24.4	− 8 17.9	+1.2576	0.5537	0.2054	+90	+43
26 B. Tauri	6.4	0.88	2.3	17 32.0	25 8 43.2	+ 3 35.4	−1.1539	0.5551	0.1862	−30	−72
33 B. Tauri	6.3	0.85	2.6	16 14.4	11 5.5	+ 5 52.7	+0.6176	0.5555	0.1822	+83	0
148 B. Tauri	5.9	0.78	2.1	17 3.4	17 10.1	+11 44.7	+0.8521	0.5564	0.1716	+90	+15
163 B. Tauri	5.8	−0.74	−1.6	+17 56.2	20 32.3	− 9 0.2	+0.5070	0.5569	+0.1655	+74	− 4
43 Tauri	5.5	0.70	0.9	19 22.1	26 0 12.4	− 5 27.9	−0.3875	0.5574	0.1586	+19	−52
ω Tauri	4.8	0.67	0.5	20 21.3	3 45.8	− 2 1.9	−0.8648	0.5580	0.1518	− 9	−70
53 Tauri	5.3	0.66	0.2	20 55.4	4 42.5	− 1 7.2	−1.3155	0.5581	0.1500	−61	−69
85 H.' Tauri	6.0	0.64	1.0	18 31.5	5 10.5	− 0 40.1	+1 2585	0.5581	0.1491	+90	+52
224 B. Tauri	6.1	−0.64	−0.3	+20 36.4	6 0.6	+ 0 8.2	−0.7928	0.5583	+0.1474	− 4	−69
227 B. Tauri	5.9	0.63	0.2	20 46.2	6 31.0	+ 0 37.5	−0.8898	0.5584	0.1464	−11	−69
234 B. Tauri	6.0	0.61	−0.9	18 50.0	7 9.8	+ 1 15.0	+1.2309	0.5585	0.1451	+90	+48
247 B. Tauri	5.8	0.61	+0.1	21 25.0	8 28.0	+ 2 30.4	−1.2859	0.5586	0.1425	−51	−69
ε Tauri	3.6	0.60	−0.7	18 58.7	8 46.3	+ 2 48.0	+1.3101	0.5587	0.1419	+90	+64
282 B. Tauri	6.4	−0.56	−0.4	+19 41.7	11 52.7	+ 5 47.9	+0.9937	0.5591	+0.1357	+90	+28
129 H.' Tauri	5.8	0.55	−0.1	20 30.1	12 59.1	+ 6 51.9	+0.2952	0.5593	0.1334	+58	−12
ι Tauri	4.7	0.41	+0.6	21 27.6	23 49.4	− 6 40.7	+0.6117	0.5606	0.1105	+85	+ 7
330 B. Tauri	6.3	0.40	0.5	21 9.1	27 0 23.0	− 6 8.2	+1.0008	0.5606	0.1093	+90	+32
105 Tauri	6.0	0.38	0.7	21 35.1	1 55.8	− 4 38.8	+0.7090	0.5607	0.1059	+90	+14
108 Tauri	6.2	−0.34	+1.0	+22 10.9	5 12.4	− 1 29.1	+0.4138	0.5610	+0.0986	+67	− 2
ϰ Tauri	5.1	0.32	0.9	22 0.2	6 52.3	+ 0 7.2	+0.7647	0.5612	0.0951	+90	+18
ο Tauri	4.8	0.27	1.0	21 51.6	10 30.9	+ 3 38.0	+1.2501	0.5614	0.0869	+90	+58
121 Tauri	5.1	0.23	1.8	23 58.8	13 52.7	+ 6 52.7	−0.7253	0.5615	0.0793	− 1	−66
175 H.' Tauri	6.5	0.19	1.4	22 37.0	16 47.0	+ 9 40.8	+0.9494	0.5616	0.0726	+90	+32
394 B. Tauri	6.0	−0.18	+1.5	+23 9.7	17 19.3	+10 11.9	+0.4059	0.5616	+0.0714	+67	0
132 Tauri	5.0	0.15	2.0	24 32.3	19 46.4	−11 26.2	−0.8951	0.5616	0.0659	−13	−65
412 B. Tauri	5.8	0.11	2.0	24 14.2	23 13.7	− 8 6.3	−0.3610	0.5616	0.0578	+20	−40
1 Geminorum	4.1	0.07	1.6	23 16.2	28 2 22.6	− 5 4.1	+0.8472	0.5615	0.0506	+90	+27
3 Geminorum	5.6	0.04	1.6	23 7.8	4 49.6	− 2 42.3	+1.1153	0.5613	0.0449	+90	+47
5 Geminorum	5.9	−0.02	+2.0	+24 26.5	5 35.4	− 1 58.2	−0.2591	0.5613	+0.0432	+26	−33
8 Geminorum	6.1	0.00	1.9	24 0.0	7 41.0	+ 0 3.0	+0.2998	0.5611	0.0383	+59	− 2
9 Geminorum	6.2	0.00	1.8	23 46.4	7 58.5	+ 0 19.9	+0.5556	0.5611	0.0376	+80	+12
36 B. Geminorum	6.0	+0.05	1.7	23 22.7	11 43.7	+ 3 57.1	+1.1059	0.5608	0.0288	+90	+47
52 B. Geminorum	6.5	0.12	2.1	24 40.0	16 55.1	+ 8 57.5	−0.1638	0.5601	0.0168	+31	−25
ε Geminorum	3.2	+0.16	+2.2	+25 13.4	19 45.1	+11 41.5	−0.7255	0.5598	+0.0102	− 2	−65
87 B. Geminorum	5.8	0.19	1.7	23 42.6	23 19.9	− 8 51.3	+0.9318	0.5591	+0.0019	+90	+37
MARCH.											
37 Geminorum	5.7	+0.21	+2.2	+25 29.4	1 0 45.5	− 7 28.7	−0.9955	0.5588	−0.0014	−21	−65
ω Geminorum	5.2	0.25	1.8	24 20.8	3 54.9	− 4 26.0	+0.2285	0.5581	0.0086	+55	− 3
48 Geminorum	5.8	0.30	1.7	24 16.9	8 21.7	− 0 8.4	+0.2379	0.5571	0.0188	+55	− 4
52 Geminorum	6.1	0.31	1.9	25 2.7	9 20.9	+ 0 48.7	−0.6101	0.5568	0.0210	+ 6	−55
A Geminorum	5.1	0.36	1.9	25 13.6	13 15.7	+ 4 35.4	−0.9089	0.5558	0.0298	−14	−65
176 B. Geminorum	6.3	+0.43	+1.5	+24 33.9	19 53.4	+10 59.4	−0.4362	0.5538	−0.0445	+16	−44
181 B. Geminorum	6.0	0.43	1.4	24 25.8	20 19.5	+11 24.5	−0.3081	0.5537	0.0455	+23	−36
187 B. Geminorum	6.3	0.43	1.1	23 13.8	21 8.8	−11 47.8	+0.9629	0.5534	0.0472	+90	+35
κ Geminorum	3.6	0.46	1.4	24 37.0	22 41.4	−10 18.5	−0.6270	0.5529	0.0506	+ 5	−58
82 Geminorum	6.3	0.47	1.0	23 22.0	2 0 34.3	− 8 29.5	+0.6396	0.5522	0.0547	+90	+14
5 B. Cancri	6.4	+0.53	+1.0	+23 50.0	6 13.8	− 3 1.4	−0.2145	0.5500	−0.0667	+28	−33
9 Cancri	6.2	0.54	0.7	22 53.8	8 39.9	− 0 40.2	+0.6443	0.5492	0.0719	+90	+13
35 B. Cancri	6.4	0.58	+0.7	23 24.7	12 3.3	+ 2 36.4	−0.1769	0.5478	0.0788	+30	−32
γ Cancri	4.9	0.67	−0.3	21 47.8	3 1 52.9	− 8 1.5	+0.3194	0.5418	0.1059	+60	− 8
90 H.' Cancri	6.1	0.77	0.9	21 39.5	16 23.3	+ 6 0.9	−1.2575	0.5348	0.1317	−46	−68
57 B. Leonis	6.5	+0.83	−2.1	+19 16.9	4 7 36.4	− 3 14.4	−0.8231	0.5273	−0.1557	− 6	−71

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

MARCH.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1909.0.		Apparent Declination.	Washington Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
		Δα	Δδ								
		s	″	° ′	d h m	h m				°	°
107 B. Leonis	6.3	+0.84	−2.9	+16 12.0	**4** 18 19.2	+ 7 8.8	+0.8436	0.5223	−0.1705	+90	+13
η Leonis	3.6	0.85	2.8	17 12.4	19 8.8	+ 7 56.8	−0.4137	0.5219	0.1716	+18	−56
42 Leonis	6.1	0.86	3.3	15 26.0	**5** 2 36.6	− 8 48.8	+0.2373	0.5184	0.1808	+54	−21
46 Leonis	5.8	0.86	3.6	14 36.2	7 59.6	− 4 35.3	+0.1690	0.5162	0.1869	+50	−26
k Leonis	5.5	0.87	4.0	14 40.5	15 27.7	+ 3 39.8	−1.3359	0.5130	0.1948	−52	−75
ι Leonis	4.1	+0.86	−4.9	+11 1.8	**6** 11 32.9	− 0 49.2	−1.3758	0.5059	−0.2117	−60	−79
ω Virginis	5.4	0.84	5.2	8 38.2	19 29.0	+ 6 53.6	−0.4154	0.5037	0.2168	+19	−63
ξ Virginis	4.8	0.83	5.3	8 45.8	23 13.2	+10 31.6	−1.3695	0.5029	0.2190	−54	−81
ν Virginis	4.2	0.82	5.3	7 2.3	23 32.5	+10 50.4	+0.4782	0.5028	0.2191	+70	−14
36 B. Virginis	6.5	0.80	5.5	6 3.9	**7** 9 24.3	− 3 34.2	−0.6240	0.5008	0.2237	+ 8	−80
c Virginis	5.1	+0.76	−5.6	+ 3 49.1	18 36.8	+ 5 23.3	−0.2001	0.4997	−0.2267	+30	−52
250 B. Virginis	5.9	0.73	5.7	+ 2 21.2	**8** 4 37.0	− 8 52.9	−0.8517	0.4990	0.2287	− 6	−88
65 Virginis	6.0	0.61	5.2	− 4 27.0	**9** 5 29.7	− 8 41.0	+0.9968	0.5006	0.2276	+86	+15
66 Virginis	5.7	0.60	5.2	4 41.4	6 10.0	− 8 1.8	+1.1095	0.5007	0.2274	+85	+23
80 Virginis	5.6	0.58	5.2	4 56.1	12 11.8	− 2 10.0	+0.0122	0.5017	0.2258	+41	−40
566 B. Virginis	6.4	+0.55	−5.2	− 5 2.5	16 46.8	+ 2 17.4	−0.8999	0.5030	−0.2243	− 9	−90
88 Virginis	6.5	0.54	5.0	6 23.1	19 9.7	+ 4 36.3	+0.0490	0.5036	0.2233	+42	−38
598 B. Virginis	6.1	0.51	4.8	7 36.8	22 46.6	+ 8 7.1	+0.5977	0.5047	0.2217	+77	− 9
623 B. Virginis	6.5	0.48	4.5	8 49.3	**10** 3 49.3	−10 58.7	+0.8160	0.5063	0.2193	+81	+ 3
95 Virginis	5.4	0.48	4.5	8 52.8	5 5.4	− 9 44.8	+0.6026	0.5066	0.2186	+76	− 9
κ Virginis	4.2	+0.46	−4.3	− 9 51.1	8 22.8	− 6 32.9	+0.9535	0.5078	−0.2167	+80	+12
2 Libræ	6.3	0.42	4.0	11 18.0	13 57.7	− 1 7.6	+1.3430	0.5100	0.2131	+79	+50
4 G. Libræ	6.5	0.41	4.1	11 15.5	14 37.7	− 0 28.8	+1.1546	0.5102	0.2126	+79	+27
6 B. Libræ	6.2	0.36	3.8	11 55.2	21 7.9	+ 5 50.1	+0.5110	0.5131	0.2078	+67	−13
22 B. Libræ	6.4	0.33	3.9	12 27.5	**11** 2 44.7	+11 17.1	−0.0535	0.5159	0.2031	+34	−44
μ Libræ	5.4	+0.32	−3.5	−13 46.3	3 27.4	+11 58.6	+1.2368	0.5162	−0.2024	+76	+36
ο Libræ	6.2	0.19	3.2	15 13.3	19 29.5	+ 3 31.7	−0.3054	0.5252	0.1859	+18	−59
32 Libræ	5.9	0.16	2.9	16 24.0	23 3.4	+ 6 59.0	+0.3188	0.5274	0.1817	+51	−23
34 Libræ	6.0	0.15	2.9	16 17.9	**12** 0 14.9	+ 8 8.2	−0.0074	0.5282	0.1802	+33	−41
ζ Libræ	5.6	0.14	2.9	16 32.7	1 21.0	+ 9 12.2	+0.0628	0.5289	0.1788	+36	−37
47 Libræ	5.8	+0.04	−2.2	−19 6.9	11 59.4	− 4 29.5	+1.0099	0.5360	−0.1644	+71	+18
β^1 Scorpii	2.9	−0.01	2.1	19 33.4	16 55.5	+ 0 17.0	+0.6910	0.5394	0.1570	+70	− 2
56 B. Scorpii	5.0	0.01	2.1	19 33.2	16 55.8	+ 0 17.2	+0.6863	0.5394	0.1570	+70	− 3
73 B. Scorpii	6.4	0.03	2.6	18 6.0	19 3.5	+ 2 20.7	−1.2071	0.5409	0.1536	−44	−90
ν Scorpii	3.9	0.04	2.2	19 13.5	20 0.4	+ 3 15.8	−0.1423	0.5417	0.1521	+22	−49
58 G. Scorpii	6.2	−0.08	−2.0	−19 59.8	23 18.6	+ 6 27.4	+0.1919	0.5439	−0.1467	+39	−30
ψ Ophiuchi	4.6	0.10	2.1	19 49.5	**13** 1 36.6	+ 8 40.8	−0.3249	0.5456	0.1429	+12	−61
ω Ophiuchi	4.5	0.14	1.7	21 16.4	5 15.7	−11 47.4	+0.7132	0.5483	0.1365	+69	− 1
123 B. Scorpii	6.5	0.18	2.1	20 13.9	9 6.3	− 8 4.7	−0.9088	0.5511	0.1295	−23	−90
24 Ophiuchi	5.5	0.27	1.3	23 0.4	16 18.3	− 1 7.6	+1.1614	0.5563	0.1157	+67	+34
116 B. Ophiuchi	6.3	−0.31	−1.9	−21 26.4	20 28.0	+ 2 53.3	−0.9663	0.5594	−0.1073	−29	−90
191 B. Ophiuchi	6.3	0.41	1.2	24 9.7	**14** 4 36.5	+10 44.5	+1.1074	0.5650	0.0900	+66	+29
b Ophiuchi	4.4	0.42	1.2	24 5.6	5 9.2	+11 15.9	+0.9860	0.5654	0.0888	+66	+19
51 Ophiuchi	4.8	0.44	1.3	23 53.6	7 18.8	−10 39.2	+0.5882	0.5670	0.0840	+58	− 7
63 Ophiuchi	6.1	0.57	1.3	24 52.2	17 11.4	− 1 8.4	+0.8925	0.5735	0.0609	+65	+12
4 Sagittarii	4.8	−0.59	−1.8	−23 48.5	19 14.6	+ 0 50.3	−0.3377	0.5748	−0.0560	+ 2	−62
7 Sagittarii	5.5	0.60	1.6	24 17.0	20 30.1	+ 2 2.9	+0.0887	0.5754	0.0529	+24	−35
9 Sagittarii	6.0	0.61	1.6	24 21.8	20 55.4	+ 2 27.2	+0.1513	0.5757	0.0519	+27	−32
1 Sagittarii	5.2	0.65	2.0	23 43.3	**15** 0 10.1	+ 5 34.5	−0.6738	0.5777	0.0438	−17	−90
67 B. Sagittarii	6.4	0.69	1.4	25 38.4	2 59.5	+ 8 17.6	+1.2096	0.5792	0.0367	+64	+43
70 B. Sagittarii	6.4	−0.70	−1.7	−24 57.4	4 9.5	+ 9 24.9	+0.4582	0.5798	−0.0337	+44	−15
λ Sagittarii	2.9	0.74	1.6	25 28.4	6 46.5	+11 55.9	+0.9135	0.5813	0.0270	+65	+14
24 Sagittarii	5.7	0.76	2.2	24 6.1	9 11.7	− 9 44.5	−0.5667	0.5826	0.0207	−14	−81
117 B. Sagittarii	5.8	0.78	2.4	23 35.0	11 4.1	− 7 56.5	−1.1358	0.5834	0.0158	−51	−90
26 Sagittarii	6.1	0.80	2.4	23 55.2	12 24.6	− 6 39.1	−0.8067	0.5839	0.0123	−28	−90
126 B. Sagittarii	5.7	−0.82	−2.0	−25 6.2	13 35.0	− 5 31.4	+0.4045	0.5845	−0.0092	+39	−18

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

MARCH.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1909.0.		Apparent Declination.	Washington Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
		Δα	Δδ								
		s	"	° '	d h m	h m				°	°
162 B. Sagittarii	6.4	-0.88	-2.3	-25 0.0	**15** 18 59.6	- 0 19.4	+0.2852	0.5868	+0.0053	+31	-24
127 G. Sagittarii	6.4	0.89	2.3	25 4.2	19 48.9	+ 0 28.0	+0.3629	0.5870	0.0075	+36	-20
172 B. Sagittarii	5.8	0.90	2.5	24 58.4	20 38.2	+ 1 15.3	+0.2707	0.5874	0.0097	+30	-25
189 B. Sagittarii	6.1	0.93	2.6	24 48.0	22 56.1	+ 3 27.8	+0.1224	0.5883	0.0160	+22	-34
ψ Sagittarii	4.8	0.96	2.6	25 24.9	**16** 1 48.9	+ 6 13.9	+0.8087	0.5891	0.0238	+65	+ 7
208 B. Sagittarii	6.1	-0.96	-2.9	-24 20.1	1 50.1	+ 6 15.0	-0.2966	0.5891	+0.0239	+ 1	-59
χ Sagittarii	4.9	1.00	3.0	24 41.2	5 40.3	+ 9 56.1	+0.1745	0.5902	0.0344	+27	-31
49 Sagittarii	5.5	1.00	3.1	24 8.5	5 46.2	+10 1.7	-0.3787	0.5902	0.0346	- 2	-65
51 Sagittarii	5.8	1.05	3.1	24 55.2	9 54.3	-10 0.0	+0.5813	0.5913	0.0460	+54	- 8
h Sagittarii	4.7	1.05	3.1	25 5.2	10 10.0	- 9 44.9	+0.7628	0.5913	0.0467	+65	+ 4
53 Sagittarii	6.3	-1.06	-3.6	-23 38.2	11 25.0	- 8 32.8	-0.6534	0.5916	+0.0501	-16	-90
274 B. Sagittarii	6.1	1.06	3.6	23 38.3	11 31.9	- 8 26.2	-0.6449	0.5916	0.0505	-15	-90
308 B. Sagittarii	6.3	1.13	3.8	24 10.1	17 5.6	- 3 5.8	+0.2176	0.5924	0.0657	+32	-28
329 B. Sagittarii	6.1	1.14	4.3	22 59.3	19 53.2	- 0 24.9	-0.7838	0.5927	0.0733	-21	-90
336 B. Sagittarii	6.5	1.15	4.4	22 51.1	20 48.4	+ 0 28.1	-0.8531	0.5928	0.0758	-25	-90
4 Capricorni	5.7	-1.20	-4.9	-22 5.6	**17** 2 24.4	+ 5 50.6	-1.1499	0.5929	+0.0909	-46	-90
36 B. Capricorni	6.2	1.25	5.0	22 41.7	6 54.2	+10 9.6	-0.1059	0.5929	0.1028	+18	-47
17 Capricorni	5.8	1.31	5.6	21 50.8	13 26.5	- 7 33.7	-0.2284	0.5924	0.1199	+13	-54
η Capricorni	4.8	1.36	6.4	20 13.0	20 38.5	- 0 38.8	-0.9268	0.5913	0.1379	-24	-90
χ Capricorni	5 3	1.38	6.2	21 33.7	22 15.8	+ 0 54.7	+0.6410	0.5909	0.1419	+66	- 5
27 Capricorni	6.1	-1.38	-6.4	-20 55.4	22 39.5	+ 1 17.4	+0.0617	0.5909	+0.1429	+31	-37
φ Capricorni	5.3	1.40	6.4	21 1.9	**18** 1 3.9	+ 3 36.2	+0.5195	0.5903	0.1487	+58	-12
33 Capricorni	5.3	1.42	6.6	21 14.4	4 26.7	+ 6 50.9	+1.2419	0.5895	0.1566	+69	+42
128 B. Capricorni	6.5	1.43	7.1	19 32.8	6 46.8	+ 9 5.5	-0.0693	0.5889	0.1619	+26	-44
37 Capricorni	5.7	1.45	7.0	20 29.5	8 42.5	+10 56.7	+1.1847	0.5884	0.1663	+70	+35
ε Capricorni	4.7	-1.45	-7.2	-19 52.6	9 36.0	+11 48.1	+0.7226	0.5882	+0.1683	+70	0
κ Capricorni	4.8	1.46	7.4	19 17.0	11 49.7	-10 3.5	+0.5151	0.5875	0.1732	+60	-13
143 B. Capricorni	6.1	1.47	7.3	20 2.3	12 3.1	- 9 50.5	+1.3018	0.5875	0.1736	+70	+52
152 B. Capricorni	6.5	1.47	8.0	17 16.3	14 52.8	- 7 7.5	-0.9367	0.5865	0.1797	-20	-90
154 B. Capricorni	6.1	1.48	7.7	19 3.0	15 27.2	- 6 33.5	+0.9241	0.5864	0.1808	+71	+12
161 B. Capricorni	6.4	-1.50	-8.0	-18 20.6	19 41.3	- 2 30.2	+1.0087	0.5851	+0 1894	+72	+18
29 Aquarii (*mean*)	6.5	1.50	8.2	-17 24.3	19 47.9	- 2 23.7	+0.1045	0.5849	0.1897	+38	-35
				NEW	*MOON.*						
64 Ceti	5.8	1.49	7.6	+ 8 8.5	**23** 5 48.9	+ 3 45.6	+0.7409	0.5615	0.2413	+90	+ 1
$ξ^1$ Ceti	4.5	-1.49	-7.5	+ 8 25.1	6 31.6	+ 4 26.7	+0.6386	0.5615	+0.2406	+84	- 5
ξ Arietis	5.5	1.47	6.9	10 11.8	11 39.6	+ 9 23.8	+0.0909	0.5619	0.2351	+46	-33
25 Arietis	6.5	1.46	7.0	9 47.6	12 47.9	+10 29.7	+0.7605	0.5619	0.2336	+90	+ 3
31 Arietis	5.7	1.44	6.2	12 3.1	16 46.2	- 9 40.4	-0.5744	0.5623	0.2290	+10	-72
38 Arietis	5.2	1.42	6.0	12 3.7	20 23.7	- 6 10.7	+0.2363	0.5627	0.2242	+54	-24
26 B. Tauri	6.4	-1.29	-3.3	+17 32.0	**24** 17 33.5	- 9 46.4	-0.8738	0.5653	+0.1908	- 8	-72
33 B. Tauri	6.3	1.26	3.5	16 14.4	19 50.8	- 7 34.1	+0.8718	0.5656	0.1867	+90	+15
148 B. Tauri	5.9	1.21	2.9	17 3.3	**25** 1 42.6	- 1 54.9	+1.1086	0.5663	0.1758	+90	+33
163 B. Tauri	5.8	1.18	2.4	17 56.2	4 57.8	+ 1 13.2	+0.7720	0.5669	0.1693	+90	+11
43 Tauri	5.5	1.15	1.8	19 22.1	8 30.2	+ 4 37.9	-0.1056	0.5672	0.1623	+35	-35
ω Tauri	4.8	-1.12	-1.3	+20 21.3	11 56.4	+ 7 56.6	-0.5731	0.5676	+0.1552	+ 9	-62
53 Tauri	5.3	1.12	1.0	20 55.3	12 51.2	+ 8 49.3	-1.0162	0.5676	0.1533	-20	-60
224 B. Tauri	6.1	1.10	1.0	20 36.4	14 6 6	+10 2.0	-0.5008	0.5678	0.1507	+13	-58
227 B. Tauri	5.9	1.10	1.0	20 46.2	14 36.0	+10 30.3	-0.5960	0.5679	0.1496	+ 8	-63
247 B. Tauri	5.8	1.08	0.7	21 25.0	16 29.2	-11 40.6	-0.9851	0.5680	0.1455	-17	-69
282 B. Tauri	6.4	-1.03	-1.0	+19 41.7	19 47.0	- 8 30.1	+1.2615	0.5683	+0.1385	+90	+53
129 H'. Tauri	5.8	1.02	-0.7	20 30.1	20 51.3	- 7 28.1	+0.5741	0.5684	0.1361	+81	+ 3
ι Tauri	4.7	0.90	+0.3	21 27.6	**26** 7 21.0	+ 2 38.6	+0.8902	0.5689	0.1124	+90	+24
330 B. Tauri	6.3	0.89	0.2	21 9.0	7 53.5	+ 3 9.9	+1.2740	0.5689	0.1112	+90	+59
105 Tauri	6.0	0.87	0.4	21 35.1	9 23.5	+ 4 36.5	+0.9867	0.5690	0.1076	+90	+31
108 Tauri	6.2	-0.84	+0.7	+22 10.9	12 34.3	+ 7 40 4	+0.6963	0.5690	+0.1003	+90	+13

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

MARCH.

The Star's							At Conjunction in R. A.					Limiting Parallels.	
Name.			Mag.	Red'ns from 1909.0.		Apparent Declination.	Washington Mean Time.	Hour Angle, *H*	*Y*	*x*′	*y*′	N.	S.
				Δα	Δδ								
				s	″	° ′	d h m	h m				°	°
n		Tauri	5.1	−0.81	+0.8	+22 0.2	**26** 14 11.2	+ 9 13.7	+1.0427	0.5689	+0.0964	+90	+36
121		Tauri	5.1	0.74	1.7	23 58.8	20 59.9	− 8 12.6	−0.4273	0.5685	0.0803	+17	−46
175	H′.	Tauri	6.5	0.69	1.4	22 37.0	23 49.5	− 5 29.2	+1.2261	0.5683	0.0735	+90	+55
394	B.	Tauri	6.0	0.68	1.6	23 9.7	**27** 0 20.9	− 4 58.9	+0.6893	0.5683	0.0722	+90	+15
132		Tauri	5.0	0.65	2.2	24 32.3	2 44.2	− 2 40.9	−0.5960	0.5680	0.0664	+ 7	−57
412	B.	Tauri	5.8	−0.61	+2.2	+24 14.3	6 6.3	+ 0 33.8	−0.0690	0.5676	+0.0583	+37	−23
1		Geminorum	4.1	0.56	2.0	23 16.2	9 10.7	+ 3 31.5	+1.1244	0.5672	0.0508	+90	+47
5		Geminorum	5.9	0.52	2.5	24 26.5	12 19.0	+ 6 33.0	+0.0299	0.5667	0.0432	+43	−17
8		Geminorum	6.1	0.49	2.4	24 0.0	14 21.8	+ 8 31.4	+0.5821	0.5663	0.0382	+83	+13
9		Geminorum	6.2	0.49	2.3	23 45.4	14 39.0	+ 8 47.9	+0.8351	0.5662	0.0375	+90	+27
52	B.	Geminorum	6.5	−0.37	+2.8	+24 40.1	23 24.5	− 6 45.7	+0.1197	0.5643	+0.0163	+48	− 9
ε		Geminorum	3.2	0.33	3.1	25 13.4	**28** 2 11.4	− 4 4.6	−0.4382	0.5635	0.0096	+16	−41
87	B.	Geminorum	5.8	0.28	2.6	23 42.6	5 42.4	− 0 41.3	+1.2020	0.5624	+0.0012	+90	+57
37		Geminorum	5.7	0.26	3.2	25 29.5	7 6.5	+ 0 39.9	−0.7089	0.5620	−0.0021	0	−62
ω		Geminorum	5.2	0.21	2.9	24 20.8	10 12.8	+ 3 39.5	+0.5024	0.5610	0.0095	+75	+11
48		Geminorum	5.8	−0.15	+2.9	+24 16.9	14 35.6	+ 7 53.0	+0.5090	0.5595	−0.0197	+76	+11
52		Geminorum	6.1	0.14	3.1	25 2.7	15 34.0	+ 8 49.4	−0.3332	0.5591	0.0220	+22	−35
A		Geminorum	5.1	−0.09	3.2	25 13.6	19 25.7	−11 27.1	−0.6330	0.5577	0.0309	+ 4	−57
176	B.	Geminorum	6.3	0.00	2.9	24 33.9	**29** 1 58.8	− 5 7.8	−0.1695	0.5550	0.0457	+31	−28
181	B.	Geminorum	6.0	+0.01	2.9	24 25.8	2 24.6	− 4 42.9	−0.0426	0.5549	0.0467	+38	−21
187	B.	Geminorum	6.3	+0.02	+2.5	+23 13.8	3 13.4	− 3 55.8	+1.2197	0.5546	−0.0485	+90	+57
κ		Geminorum	3.6	0.04	2.9	24 37.1	4 45.1	− 2 27.3	−0.3618	0.5539	0.0519	+20	−40
82		Geminorum	6.3	0.06	2.5	23 22.0	6 36.9	− 0 39.3	+0.8955	0.5530	0.0559	+90	+29
5	B.	Cancri	6.4	0.14	2.6	23 50.1	12 13.5	+ 4 45.7	+0.0408	0.5503	0.0680	+43	−18
9		Cancri	6.2	0.16	2.2	22 53.8	14 38.6	+ 7 5.9	+0.8925	0.5492	0.0732	+90	+27
35	B.	Cancri	6.4	+0.21	+2.3	+23 24.8	18 0.7	+10 21.2	+0.0717	0.5475	−0.0802	+45	−18
λ		Cancri	5.9	0.25	2.6	24 18.6	21 8.4	−10 37.4	−1.1700	0.5461	0.0865	−36	−66
γ		Cancri	4.9	0.36	1.5	21 47.8	**30** 7 46.7	− 0 20.2	+0.5491	0.5405	0.1073	+79	+ 4
90	H′.	Cancri	6.1	0.52	+1.0	21 39.5	22 16.0	−10 18.9	−1.0448	0.5328	0.1330	−22	−68
57	B.	Leonis	6.5	0.64	−0.3	19 16.9	**31** 13 30.4	+ 4 26.8	−0.6378	0.5249	0.1570	+ 6	−68

APRIL.

107	B.	Leonis	6.3	+0.71	−1.5	+16 12.0	**1** 0 15.0	− 9 8.1	+1.0070	0.5196	−0.1718	+90	+24
η		Leonis	3.6	0.72	1.3	17 12.4	1 4.7	− 8 19.8	−0.2508	0.5193	0.1729	+27	−46
42		Leonis	6.1	+0.77	−2.0	+15 26.0	8 34.2	− 1 3.7	+0.3846	0.5159	−0.1822	+64	−14
46		Leonis	5.8	0.80	2.3	14 36.2	13 58.4	+ 4 11.0	+0.3051	0.5136	0.1884	+58	−18
k		Leonis	5.5	0.84	2.7	14 40.5	21 28.2	+11 27.8	−1.2155	0.5106	0.1962	−34	−75
ι		Leonis	4.1	0.92	4.1	11 1.8	**2** 17 37.4	+ 7 2.7	−1.3021	0.5042	0.2134	−42	−79
ω		Virginis	5.4	0.93	4.8	8 38.2	**3** 1 34.8	− 9 13.2	−0.3615	0.5023	0.2187	+22	−60
ξ		Virginis	4.8	+0.95	−4.9	+ 8 45.8	5 19.4	− 5 34.8	−1.3243	0.5016	−0.2209	−45	−81
ν		Virginis	4.2	0.94	5.2	7 2.3	5 38.8	− 5 16.0	+0.5214	0.5014	0.2211	+73	−12
36	B.	Virginis	6.5	0.96	5.5	6 3.9	15 31.4	+ 4 20.4	−0.6049	0.4999	0.2258	+ 9	−78
c		Virginis	5.1	0.96	6.0	3 49.1	**4** 0 44.2	−10 41.9	−0.2046	0.4992	0.2290	+30	−52
250	B.	Virginis	5.9	0.98	6.3	+ 2 21.2	10 43.9	− 0 58.5	−0.8808	0.4991	0.2312	− 7	−88
65		Virginis	6.0	+0.97	−6.8	− 4 27.0	**5** 11 32.9	− 0 50.4	+0.9044	0.5018	−0.2304	+86	+ 8
66		Virginis	5.7	0.97	6.8	4 41.4	12 13.0	− 0 11.4	+1.0154	0.5019	0.2303	+85	+15
l		Virginis	4.8	0.97	6.8	5 47.2	16 16.8	+ 3 45.7	+1.2921	0.5028	0.2294	+84	+39
80		Virginis	5.6	0.97	6.8	4 56.1	18 13.3	+ 5 38.9	−0.0945	0.5032	0.2288	+35	−46
566	B.	Virginis	6.4	0.96	6.9	5 2.6	22 47.2	+10 5.1	−1.0158	0.5044	0.2273	−16	−90
88		Virginis	6.5	+0.96	−6.8	− 6 23.1	**6** 1 9.4	−11 36.6	−0.0735	0.5053	−0.2263	+36	−45
598	B.	Virginis	6.1	0.95	6.8	7 36.8	4 45.3	− 8 6.7	+0.4067	0.5063	0.2248	+67	−16
623	B.	Virginis	6.5	0.94	6.7	8 49.3	9 46.5	− 3 14.1	+0.6741	0.5081	0.2222	+81	− 5
95		Virginis	5.4	0.94	6.7	8 52.9	11 2.3	− 2 0.4	+0.4582	0.5086	0.2216	+66	−16
96		Virginis	6.5	0.94	6.6	9 54.3	12 14.7	− 0 50.1	+1.3165	0.5090	0.2209	+80	+44
κ		Virginis	4.2	+0.94	−6.5	− 9 51.1	14 18.7	+ 1 10.4	+0.8021	0.5097	−0.2196	+80	+ 2

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

APRIL.

The Star's					At Conjunction in R. A.						Limiting Parallels.	
Name.	Mag.	Red'ns from 1909.0.		Apparent Declination.	Washington Mean Time.		Hour Angle, *H*	*Y*	*x′*	*y′*	N.	S.
		Δα	Δδ									
		s	″	° ′	d	h m	h m				°	°
2 Libræ	6.3	+0.93	−6.4	−11 18.0	**6**	19 51.9	+ 6 34.1	+1.1804	0.5119	−0.2160	+79	+29
4 G. Libræ	6.5	0.92	6.4	11 15.5		20 31.8	+ 7 12.8	+0.9910	0.5123	0.2155	+79	+15
6 B. Libræ	6.2	0.89	6.2	11 55.2	**7**	3 0.1	−10 30.3	+0.3357	0.5151	0.2106	+56	−23
22 B. Libræ	6.4	0.89	6.2	12 27.5		8 35.3	− 5 5.0	−0.2385	0.5178	0.2057	+24	−54
μ Libræ	5.4	0.89	6.0	13 46.3		9 17.8	− 4 23.7	+1.0506	0.5182	0.2051	+76	+19
o Libræ	6.2	+0.83	−5.5	−15 13.3	**8**	1 16.3	+11 5.9	−0.5171	0.5267	−0.1881	+ 7	−74
32 Libræ	5.9	0.82	5.2	16 24.1		4 49.7	− 9 27.3	+0.1029	0.5289	0.1838	+39	−35
34 Libræ	6.0	0.81	5.2	16 17.9		6 1.0	− 8 18.3	−0.2255	0.5295	0.1823	+22	−54
ζ Libræ	5.6	0.81	5.2	16 32.8		7 6.9	− 7 14.4	−0.1566	0.5303	0.1808	+25	−50
47 Libræ	5.8	0.75	4.4	19 7.0		17 44.6	+ 3 3.0	+0.7802	0.5368	0.1660	+71	+ 3
β¹ Scorpii	2.9	+0.73	−4.2	−19 33.5		22 40.9	+ 7 49.7	+0.4556	0.5399	−0.1584	+56	−16
56 B. Scorpii	5.0	0.72	4.2	19 33.3		22 41.1	+ 7 49.9	+0.4509	0.5399	0.1584	+56	−16
ω¹ Scorpii	4.3	0.72	4.0	20 25.5		23 18.8	+ 8 26.4	+1.2904	0.5402	0.1574	+70	+49
ν Scorpii	3.9	0.70	4.2	19 13.6	**9**	1 46.0	+10 48.8	−0.3834	0.5419	0.1534	+10	−64
84 B. Scorpii	6.3	0.70	3.8	20 52.7		2 54.1	+11 54.7	+1.2231	0.5426	0.1516	+69	+39
51 G. Scorpii	6.5	+0.69	−3.7	−21 4.7		4 3.7	−10 58.0	+1.2646	0.5434	−0.1496	+69	+45
58 G. Scorpii	6.2	0.68	4.0	19 59.8		5 4.6	− 9 59.2	−0.0510	0.5439	0.1479	+26	−44
ψ Ophiuchi	4.6	0.67	4.0	19 49.6		7 23.0	− 7 45.4	−0.5718	0.5455	0.1439	− 2	−80
ω Ophiuchi	4.5	0.64	3.5	21 16.4		11 2.8	− 4 13.0	+0.4680	0.5479	0.1374	+54	−15
123 B. Scorpii	6.5	0.61	3.7	20 14.0		14 54.4	− 0 29.2	−1.1648	0.5503	0.1303	−43	−90
24 Ophiuchi	5.5	+0.56	−2.8	−23 0.4		22 9.0	+ 6 30.5	+0.9126	0.5549	−0.1162	+67	+13
116 B. Ophiuchi	6.3	0.52	3.1	21 26.4	**10**	2 20.6	+10 33.3	−1.2308	0.5575	0.1077	−53	−90
39 Ophiuchi	5.1	0.48	2.2	24 11.3		7 28.9	− 8 29.3	+1.1733	0.5606	0.0968	+66	+36
191 B. Ophiuchi	6.3	0.45	2.2	24 9.7		10 33.8	− 5 30.9	+0.8547	0.5623	0.0901	+66	+ 9
b Ophiuchi	4.4	0.44	2.2	24 5.6		11 6.8	− 4 59.1	+0.7321	0.5627	0.0889	+66	+ 1
51 Ophiuchi	4.8	+0.42	−2.2	−23 53.6		13 17.9	− 2 52.7	+0.3309	0.5640	−0.0840	+41	−22
63 Ophiuchi	6.1	0.32	1.7	24 52.2		23 18.4	+ 6 46.0	+0.6366	0.5693	0.0609	+59	− 5
4 Sagittarii	4.8	0.30	2.0	23 48.5	**11**	1 23.5	+ 8 46.6	−0.6056	0.5703	0.0559	−13	−86
7 Sagittarii	5.5	0.28	1.8	24 17.0		2 40.2	+10 0.4	−0.1750	0.5710	0.0528	+10	−51
9 Sagittarii	6.0	0.28	1.8	24 21.8		3 5.9	+10 25.2	−0.1119	0.5711	0.0517	+13	−47
1 Sagittarii	5.2	+0.24	−1.9	−23 43.3		6 24.0	−10 24.0	−0.9458	0.5725	−0.0436	−34	−90
67 B. Sagittarii	6.4	0.21	1.3	25 38.4		9 16.4	− 7 38.1	+0.9581	0.5738	0.0365	+64	+17
70 B. Sagittarii	6.4	0.20	1.4	24 57.4		10 27.7	− 6 29.4	+0.1986	0.5744	0.0335	+28	−30
λ Sagittarii	2.9	0.17	1.3	25 28.4		13 7.7	− 3 55.4	+0.6595	0.5754	0.0268	+59	− 3
24 Sagittarii	5.7	0.14	1.7	24 6.1		15 35.8	− 1 32.8	−0.8375	0.5763	0.0205	−29	−90
26 Sagittarii	6.1	+0.10	−1.7	−23 55.2		18 52.8	+ 1 36.7	−1.0802	0.5775	−0.0121	−46	−90
126 B. Sagittarii	5.7	0.08	1.3	25 6.2		20 4.8	+ 2 46.0	+0.1462	0.5779	−0.0090	+23	−32
162 B. Sagittarii	6.4	0.02	1.3	24 59.9	**12**	1 36.7	+ 8 5.2	+0.0271	0.5794	+0.0054	+16	−39
127 G. Sagittarii	6.4	+0.01	1.2	25 4.2		2 27.3	+ 8 53.9	+0.1060	0.5797	0.0076	+21	−35
172 B. Sagittarii	5.8	0.00	1.3	24 58.4		3 17.7	+ 9 42.3	+0.0130	0.5798	0.0098	+16	−40
189 B. Sagittarii	6.1	−0.03	−1.3	−24 48.0		5 39.0	+11 58.2	−0.1364	0.5805	+0.0160	+ 9	−49
ψ Sagittarii	4.8	0.07	1.1	25 24.9		8 36.3	− 9 11.3	+0.5607	0.5811	0.0238	+50	− 9
208 B. Sagittarii	6.1	0.07	1.5	24 20.1		8 37.4	− 9 10.2	−0.5601	0.5811	0.0239	−13	−81
χ Sagittarii	4.9	0.12	1.4	24 41.2		12 33.8	− 5 22.8	−0.0805	0.5817	0.0343	+14	−45
49 Sagittarii	5.5	0.12	1.5	24 8.5		12 39.9	− 5 17.0	−0.6416	0.5817	0.0346	−17	−90
51 Sagittarii	5.8	−0.17	−1.2	−24 55.1		16 54.8	− 1 11.9	+0.3346	0.5822	+0.0458	+37	−22
h Sagittarii	4.7	0.18	1.2	25 5.1		17 11.0	− 0 56.4	+0.5189	0.5824	0.0465	+49	−11
53 Sagittarii	6.3	0.19	1.7	23 38.1		18 28.2	+ 0 17.8	−0.9175	0.5824	0.0499	−32	−90
274 B. Sagittarii	6.1	0.20	1.7	23 38.3		18 35.2	+ 0 24.7	−0.9086	0.5824	0.0502	−31	−90
308 B. Sagittarii	6.3	0.27	1.6	24 10.1	**13**	0 18.8	+ 5 55.1	−0.0296	0.5828	0.0653	+19	−43
329 B. Sagittarii	6.1	−0.30	−1.9	−22 59.3		3 11.5	+ 8 41.0	−1.0446	0.5828	+0.0728	−39	−90
336 B. Sagittarii	6.5	0.31	2.0	22 51.1		4 8.5	+ 9 35.9	−1.1143	0.5828	0.0753	−44	−90
36 B. Capricorni	6.2	0.44	2.1	22 41.7		14 33.8	− 4 23.0	−0.3467	0.5822	0.1020	+ 5	−63
17 Capricorni	5.8	0.53	2.5	21 50.8		21 19.3	+ 2 6.9	−0.4644	0.5813	0.1188	+ 1	−71
η Capricorni	4.8	0.61	3.1	20 13.0	**14**	4 46.2	+ 9 16.7	−1.1661	0.5798	0.1367	−43	−90
χ Capricorni	5.3	−0.64	−2.7	−21 33.6		6 27.0	+10 53.7	+0.4301	0.5795	+0.1406	+52	−17

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

APRIL.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1909.0. Δα	Red'ns from 1909.0. Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle, *H*	*Y*	*x′*	*y′*	N.	S.
		s	″	° ′	d h m	h m				°	°
27 Capricorni	6.1	−0.64	−2.9	−20 55.4	**14** 6 51.5	+11 17.2	−0.1584	0.5794	+0.1415	+19	−50
φ Capricorni	5.3	0.67	2.9	21 1.8	9 21.1	−10 18.9	+0.3102	0.5789	0.1472	+45	−24
33 Capricorni	5.3	0.71	2.9	21 14.4	12 51.0	− 6 57.0	+1.0494	0.5780	0.1550	+69	+22
128 B. Capricorni	6.5	0.73	3.5	19 32.8	15 16.1	− 4 37.4	−0.2803	0.5773	0.1603	+15	−58
37 Capricorni	5.7	0.76	3.2	20 29.5	17 15.9	− 2 42.1	+0.9972	0.5769	0.1646	+70	+18
ε Capricorni	4.7	−0.77	−3.4	−19 52.5	18 11.4	− 1 48.7	+0.5290	0.5766	+0.1665	+60	−12
κ Capricorni	4.8	0.79	3.6	19 16.9	20 29.8	+ 0 24.5	+0.3215	0.5759	0.1714	+48	−23
143 B. Capricorni	6.1	0.79	3.4	20 2.3	20 43.7	+ 0 37.9	+1.1215	0.5759	0.1719	+70	+28
152 B. Capricorni	6.5	0.82	4.3	17 16.3	23 39.4	+ 3 27.0	−1.1493	0.5750	0.1778	−36	−90
154 B. Capricorni	6.1	0.83	3.8	19 2.9	**15** 0 15.0	+ 4 1.3	+0.7430	0.5749	0.1790	+70	0
161 B. Capricorni	6.4	−0.87	−4.1	−18 20.5	4 38.1	+ 8 14.6	+0.8360	0.5736	+0.1876	+72	+ 6
29 Aquarii (*mean*)	6.5	0.87	4.4	17 24.3	4 44.9	+ 8 21.2	−0.0826	0.5736	0.1878	+28	−45
56 Aquarii	6.1	0.98	5.2	15 3.2	16 28.4	− 4 21.4	−0.1070	0.5702	0.2086	+29	−47
69 Aquarii	5.6	1.05	5.4	14 32.3	23 52.8	+ 2 46.7	+0.9677	0.5679	0.2202	+75	+14
τ Aquarii	4.4	1.06	5.5	14 4.5	**16** 0 41.2	+ 3 33.3	+0.6844	0.5676	0.2213	+76	− 4
74 Aquarii	5.8	−1.07	−6.0	−12 6.1	2 21.3	+ 5 9.8	−0.9051	0.5672	+0.2237	−13	−90
257 B. Aquarii	6.3	1.09	5.7	13 33.6	4 58.1	+ 7 40.9	+1.1322	0.5665	0.2273	+76	+26
290 B. Aquarii	6.3	1.14	6.4	11 11.1	11 27.7	−10 3.5	+0.2775	0.5649	0.2355	+53	−26
ψ¹ Aquarii	4.5	1.14	6.7	9 35.1	11 58.6	− 9 33.7	−1.1860	0.5648	0.2360	−32	−90
ψ² Aquarii	4.6	1.15	6.7	9 40.9	12 51.6	− 8 42.7	−0.8818	0.5645	0.2371	−10	−90
ψ³ Aquarii	5.2	−1.15	−6.6	−10 6.6	13 18.9	− 8 16.3	−0.3489	0.5645	+0.2375	+20	−61
336 B. Aquarii	6.3	1.18	6.7	9 46.1	17 40.2	− 4 4.4	+0.3581	0.5635	0.2422	+59	−22
351 B. Aquarii	6.5	1.20	7.1	7 58.2	20 30.2	− 1 20.4	−0.7303	0.5628	0.2450	0	−90
376 B. Aquarii	6.3	1.24	7.3	6 53.3	**17** 2 10.1	+ 4 7.4	−0.3968	0.5618	0.2499	+19	−64
30 Piscium	4.7	1.28	7.3	6 31.3	8 1.9	+ 9 46.6	+0.7193	0.5610	0.2540	+83	− 3
33 Piscium	4.7	−1.28	−7.3	− 6 13.1	9 30.7	+11 12.3	+0.7969	0.5607	+0.2549	+84	+ 2
24 B. Ceti	6.0	1.30	7.4	− 5 45.4	11 41.5	−10 41.5	+0.8975	0.5604	0.2561	+84	+ 8
				NEW	*MOON.*						
148 B. Tauri	5.9	1.43	3.3	+17 3.3	**21** 11 56.2	+10 6.8	+1.2620	0.5737	0.1798	+90	+48
163 B. Tauri	5.8	−1.42	−2.9	+17 56.2	15 6.8	−10 49.7	+0.9337	0.5744	+0.1734	+90	+21
43 Tauri	5.5	1.41	2.4	19 22.1	18 34.0	− 7 30.3	+0.0705	0.5751	0.1662	+45	−26
ω Tauri	4.8	1.40	2.0	20 21.3	21 54.9	− 4 16.9	−0.3868	0.5757	0.1590	+20	−51
53 Tauri	5.3	1.40	1.8	20 55.3	22 48.2	− 3 25.6	−0.8235	0.5758	0.1570	− 6	−69
224 B. Tauri	6.1	1.39	1.7	20 36.4	**22** 0 1.7	− 2 14.8	−0.3120	0.5761	0.1544	+24	−46
227 B. Tauri	5.9	−1.38	−1.6	+20 46.2	0 30.3	− 1 47.3	−0.4054	0.5761	+0.1533	+19	−51
247 B. Tauri	5.8	1.38	1.4	21 25.0	2 20.4	− 0 1.3	−0.7874	0.5765	0.1491	− 4	−69
129 H.′ Tauri	5.8	1.34	1.2	20 30.1	6 35.4	+ 4 4.1	+0.7597	0.5771	0.1395	+90	+13
ι Tauri	4.7	1.23	0.2	21 27.6	16 47.2	−10 7.1	+1.0839	0.5780	0.1153	+90	+38
105 Tauri	6.0	1.24	−0.1	21 35.1	18 46.2	− 8 12.7	+1.1813	0.5780	0.1105	+90	+47
108 Tauri	6.2	−1.21	+0.3	+22 10.9	21 51.3	− 5 14.6	+0.8976	0.5780	+0.1030	+90	+25
n Tauri	5.1	1.19	0.3	22 0.2	23 25.4	− 3 44.1	+1.2413	0.5780	0.0990	+90	+55
121 Tauri	5.1	1.14	1.3	23 58.8	**23** 6 1.9	+ 2 37.4	−0.2038	0.5777	0.0824	+29	−33
394 B. Tauri	6.0	1.09	1.3	23 9.7	9 17.0	+ 5 45.1	+0.9014	0.5773	0.0742	+90	+28
132 Tauri	5.0	1.08	1.9	24 32.3	11 36.0	+ 7 58.9	−0.3656	0.5771	0.0682	+20	−41
412 B. Tauri	5.8	−1.04	+2.0	+24 14.2	14 52.1	+11 7.6	+0.1571	0.5766	+0.0599	+50	−11
5 Geminorum	5.9	0.96	2.4	24 26.5	20 53.8	− 7 4.3	+0.2591	0.5754	0.0444	+57	− 5
8 Geminorum	6.1	0.93	2.4	24 0.0	22 53.0	− 5 9.5	+0.8056	0.5749	0.0394	+90	+25
9 Geminorum	6.2	0.93	2.3	23 46.4	23 9.6	− 4 53.6	+1.0556	0.5749	0.0386	+90	+43
52 B. Geminorum	6.5	0.82	3.0	24 40.1	**24** 7 40.1	+ 3 17.8	+0.3540	0.5724	0.0169	+64	+ 3
ε Geminorum	3.2	−0.79	+3.3	+25 13.4	10 22.3	+ 5 54.0	−0.1958	0.5715	+0.0101	+30	−26
37 Geminorum	5.7	0.73	3.6	25 29.5	15 9.4	+10 30.5	−0.4613	0.5698	−0.0019	+15	−42
39 Geminorum	6.2	0.71	3.9	26 12.1	16 37.2	+11 55.0	−1.2222	0.5692	0.0055	−45	−64
40 Geminorum	6.3	0.70	3.9	26 2.4	16 54.0	−11 48.7	−1.0511	0.5690	0.0062	−25	−64
ω Geminorum	5.2	0.68	3.3	24 20.8	18 10.7	−10 34.9	+0.7367	0.5684	0.0094	+90	+24
48 Geminorum	5.8	−0.62	+3.4	+24 17.0	22 26.7	− 6 28.2	+0.7446	0.5665	−0.0199	+90	+24

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

THE STAR'S							AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.			Mag.	Red'ns from 1909.0.		Apparent Declination.	Washington Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
				$\Delta\alpha$	$\Delta\delta$								
				s	"	° ′	d h m	h m				°	°
							APRIL.						
52		Geminorum	6.1	-0.61	+3.7	+25 2.7	**24** 23 23.6	- 5 33.4	-0.0876	0.5661	-0.0222	+36	-21
A		Geminorum	5.1	0.56	3.9	25 13.6	**25** 3 9.4	- 1 55.7	-0.3832	0.5643	0.0312	+19	-39
176	B.	Geminorum	6.3	0.46	3.8	24 33.9	9 33.1	+ 4 14.3	+0.0761	0.5610	0.0463	+45	-15
181	B.	Geminorum	6.0	0.46	3.8	24 25.8	9 58.4	+ 4 38.6	+0.2017	0.5608	0.0473	+53	- 9
κ		Geminorum	3.6	0.43	3.9	24 37.1	12 15.7	+ 6 51.1	-0.1139	0.5595	0.0525	+35	-26
82		Geminorum	6.3	-0.40	+3.5	+23 22.1	14 5.0	+ 8 36.5	+1.1305	0.5586	-0.0567	+90	+47
5	B.	Cancri	6.4	0.32	3.7	23 50.1	19 34.4	-10 5.7	+0.2847	0.5554	0.0689	+56	- 6
9		Cancri	6.2	0.29	3.4	22 53.8	21 56.5	- 7 48.5	+1.1282	0.5540	0.0741	+90	+45
35	B.	Cancri	6.4	0.24	3.6	23 24.8	**26** 1 14.7	- 4 37.2	+0.3152	0.5521	0.0812	+60	- 5
λ		Cancri	5.9	0.20	4.0	24 18.6	4 18.9	- 1 39.3	-0.9156	0.5501	0.0876	-13	-66
γ		Cancri	4.9	-0.06	+3.0	+21 47.8	14 46.5	+ 8 27.1	+0.7861	0.5437	-0.1084	+90	+17
90	H′.	Cancri	6.1	+0.12	2.9	21 39.6	**27** 5 4.2	- 1 43.2	-0.8022	0.5346	0.1343	- 5	-68
57	B.	Leonis	6.5	0.29	1.7	19 17.0	20 10.0	-11 5.9	-0.4082	0.5254	0.1581	+19	-54
107	B.	Leonis	6.3	0.40	0.5	16 12.1	**28** 6 50.7	- 0 44.9	+1.2201	0.5194	0.1729	+90	+42
η		Leonis	3.6	0.41	+0.8	17 12.4	7 40.2	+ 0 3.2	-0.0330	0.5189	0.1739	+39	-34
42		Leonis	6.1	+0.48	0.0	+15 26.1	15 7.9	+ 7 17.5	+0.5927	0.5151	-0.1831	+81	- 3
46		Leonis	5.8	0.53	-0.4	14 36.3	20 31.2	-11 28.6	+0.5076	0.5125	0.1892	+73	- 8
k		Leonis	5.5	0.60	0.6	14 40.5	**29** 4 0.3	- 4 12.6	-1.0171	0.5093	0.1971	-17	-75
ι		Leonis	4.1	0.75	2.3	11 1.8	**30** 0 9.9	- 8 37.3	-1.1322	0.5023	0.2142	-25	-79
ω		Virginis	5.4	0.80	3.2	8 38.2	8 8.0	- 0 52.5	-0.2060	0.5002	0.2195	+30	-50
ξ		Virginis	4.8	+0.83	-3.3	+ 8 45.8	11 53.0	+ 2 46.4	-1.1730	0.4996	-0.2217	-28	-81
ν		Virginis	4.2	0.82	3.8	7 2.3	12 12.4	+ 3 5.2	+0.6686	0.4995	0.2219	+87	- 4
π		Virginis	4.6	0.88	3.9	7 7.2	20 30.1	+11 9.3	-1.2808	0.4983	0.2260	-38	-83
36	B.	Virginis	6.5	0.89	4.2	6 3.9	22 6.0	-11 17.5	-0.4723	0.4980	0.2267	+16	-68
							MAY.						
c		Virginis	5.1	+0.93	-4.9	+ 3 49.1	**1** 7 19.8	- 2 18.8	-0.0892	0.4974	-0.2300	+36	-45
250	B.	Virginis	5.9	0.99	5.4	+ 2 21.2	17 20.3	+ 7 25.3	-0.7827	0.4976	0.2324	- 1	-88
65		Virginis	6.0	1.10	6.8	- 4 27.0	**2** 18 8.7	+ 7 33.0	+0.9504	0.5016	0.2323	+86	+11
66		Virginis	5.7	+1.10	-6.9	- 4 41.4	18 48.7	+ 8 11.9	+1.0599	0.5017	-0.2321	+85	+18
l		Virginis	4.8	1.11	7.0	5 47.3	22 52.0	-11 51.6	+1.3278	0.5028	0.2313	+84	+43
80		Virginis	5.6	1.12	6.9	4 56.1	**3** 0 48.2	- 9 58.7	-0.0590	0.5034	0.2308	+37	-44
566	B.	Virginis	6.4	1.14	6.9	5 2.6	5 21.2	- 5 33.3	-0.9865	0.5048	0.2293	-14	-90
88		Virginis	6.5	1.15	7.1	6 23.1	7 42.9	- 3 15.6	-0.0514	0.5056	0.2284	+38	-44
598	B.	Virginis	6.1	+1.16	-7.2	- 7 36.8	11 17.9	+ 0 13.4	+0.4800	0.5070	-0.2270	+68	-16
623	B.	Virginis	6.5	1.18	7.3	8 49.4	16 17.7	+ 5 4.6	+0.6770	0.5090	0.2246	+81	- 5
95		Virginis	5.4	1.18	7.2	8 52.9	17 33.1	+ 6 17.9	+0.4594	0.5094	0.2239	+66	-17
96		Virginis	6.5	1.19	7.3	9 54.3	18 45.2	+ 7 27.9	+1.3127	0.5100	0.2232	+80	+43
κ		Virginis	4.2	1.19	7.2	9 51.2	20 48.5	+ 9 27.6	+0.7962	0.5109	0.2221	+80	+ 2
2		Libræ	6.3	+1.21	-7.3	-11 18.0	**4** 2 19.6	- 9 10.7	+1.1626	0.5135	-0.2185	+79	+27
4	G.	Libræ	6.5	1.21	7.3	11 15.5	2 59.2	- 8 32.3	+0.9725	0.5139	0.2180	+79	+13
6	B.	Libræ	6.2	1.21	7.0	11 55.2	9 24.8	- 2 18.1	+0.3076	0.5171	0.2132	+55	-25
22	B.	Libræ	6.4	1.24	7.1	12 27.5	14 57.3	+ 3 4.6	-0.2745	0.5200	0.2084	+22	-57
μ		Libræ	5.4	1.24	7.1	13 46.3	15 39.5	+ 3 45.6	+1.0085	0.5204	0.2078	+76	+16
o		Libræ	6.2	+1.27	-6.6	-15 13.3	**5** 7 29.2	- 4 53.9	-0.5798	0.5299	-0.1909	+ 4	-80
32		Libræ	5.9	1.27	6.4	16 24.1	11 0.4	- 1 29.2	+0.0321	0.5321	0.1865	+35	-39
34		Libræ	6.0	1.27	6.4	16 18.0	12 10.9	- 0 21.0	-0.2968	0.5328	0.1850	+18	-5[illegible]
ζ		Libræ	5.6	1.28	6.3	16 32.8	13 16.2	+ 0 42.3	-0.2299	0.5335	0.1836	+21	-54
47		Libræ	5.8	1.28	5.7	19 7.0	23 47.1	+10 52.9	+0.6876	0.5404	0.1687	+70	- 3
β^1		Scorpii	2.9	+1.28	-5.4	-19 33.5	**6** 4 40.0	- 8 23.8	+0.3575	0.5437	-0.1610	+50	-21
56	B.	Scorpii	5.0	1.28	5.4	19 33.3	4 40.2	- 8 23.6	+0.3528	0.5437	0.1610	+50	-22
ω^1		Scorpii	4.3	1.29	5.3	20 25.5	5 17.5	- 7 47.5	+1.1884	0.5441	0.1600	+70	+34
ν		Scorpii	3.9	1.27	5.3	19 13.6	7 43.1	- 5 26.7	-0.4827	0.5456	0.1560	+ 5	-72
84	B.	Scorpii	6.3	1.28	5.2	20 52.7	8 50.4	- 4 21.7	+1.1166	0.5464	0.1540	+69	+27
51	G.	Scorpii	6.5	+1.28	-5.0	-21 4.8	9 59.2	- 3 15.2	+1.1565	0.5471	-0.1521	+69	+31

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

MAY.

The Star's					At Conjunction in R. A.					Limiting Parallels	
Name.	Mag.	Red'ns from 1909.0. Δα	Red'ns from 1909.0. Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
		s	"	° '	d h m	h m				°	°
58 G. Scorpii	6.2	+1.27	−5.1	−19 59.9	**6** 10 59.4	− 2 17.0	−0.1557	0.5479	−0.1503	+21	−50
ψ Ophiuchi	4.6	1.27	5.0	19 49.6	13 16.3	− 0 4.7	−0.6776	0.5493	0.1463	− 7	−90
ω Ophiuchi	4.5	1.27	4.6	21 16.4	16 53.7	+ 3 25.3	+0.3542	0.5517	0.1397	+47	−21
123 B. Scorpii	6.5	1.25	4.6	20 14.0	20 42.8	+ 7 6.6	−1.2781	0.5542	0.1325	−56	−90
24 Ophiuchi	5.5	1.24	3.7	23 0.5	**7** 3 52.8	− 9 58.3	+0.7850	0.5586	0.1182	+67	+ 4
39 Ophiuchi	5.1	+1.21	−3.0	−24 11.4	13 7.4	− 1 3.3	+1.0365	0.5640	−0.0985	+66	+22
191 B. Ophiuchi	6.3	1.20	2.7	24 9.7	16 10.6	+ 1 53.3	+0.7157	0.5657	0.0917	+66	0
b Ophiuchi	4.4	1.19	2.8	24 5.6	16 43.4	+ 2 24.9	+0.5929	0.5659	0.0905	+58	− 8
51 Ophiuchi	4.8	1.18	2.7	23 53.6	18 53.3	+ 4 30.1	+0.1904	0.5671	0.0856	+33	−30
63 Ophiuchi	6.1	1.12	1.8	24 52.2	**8** 4 49.5	− 9 55.5	+0.4879	0.5720	0.0620	+49	−13
4 Sagittarii	4.8	+1.10	−1.9	−23 48.5	6 53.8	− 7 55.9	−0.7554	0.5728	−0.0570	−21	−90
7 Sagittarii	5.5	1.09	1.7	24 17.0	8 10.1	− 6 42.4	−0.3260	0.5733	0.0539	+ 1	−61
9 Sagittarii	6.0	1.09	1.6	24 21.8	8 35.6	− 6 17.8	−0.2631	0.5736	0.0528	+ 5	−57
1 Sagittarii	5.2	1.06	1.6	23 43.3	11 52.6	− 3 8.1	−1.0997	0.5748	0.0446	−45	−90
67 B. Sagittarii	6.4	1.05	1.0	25 38.4	14 44.3	− 0 22.9	+0.8032	0.5758	0.0374	+64	+ 6
70 B. Sagittarii	6.4	+1.04	−1.0	−24 57.4	15 55.4	+ 0 45.6	+0.0424	0.5762	−0.0344	+20	−39
λ Sagittarii	2.9	1.02	0.8	25 28.4	18 34.8	+ 3 19.0	+0.5020	0.5771	0.0276	+47	−12
24 Sagittarii	5.7	0.99	0.9	24 6.1	21 2.6	+ 5 41.3	−0.9984	0.5777	0.0212	−40	−90
26 Sagittarii	6.1	0.96	0.8	23 55.1	**9** 0 19.2	+ 8 50.5	−1.2439	0.5786	0.0127	−62	−90
126 B. Sagittarii	5.7	0.95	0.4	25 6.2	1 31.1	+ 9 59.6	−0.0157	0.5789	−0.0096	+14	−42
162 B. Sagittarii	6.4	+0.90	−0.1	−24 59.9	7 3.0	− 8 41.1	−0.1380	0.5799	+0.0049	+ 7	−49
127 G. Sagittarii	6.4	0.89	0.0	25 4.2	7 53.6	− 7 52.4	−0.0593	0.5801	0.0071	+12	−45
172 B. Sagittarii	5.8	0.88	0.0	24 58.4	8 44.1	− 7 3.9	−0.1531	0.5801	0.0094	+ 7	−50
189 B. Sagittarii	6.1	0.86	+0.1	24 48.0	11 5.6	− 4 47.8	−0.3040	0.5805	0.0156	0	−60
ψ Sagittarii	4.8	0.83	0.4	25 24.8	14 3.3	− 1 56.9	+0.3943	0.5808	0.0234	+39	−19
208 B. Sagittarii	6.1	+0.82	+0.1	−24 20.1	14 4.5	− 1 55.7	−0.7305	0.5808	+0.0234	−23	−90
χ Sagittarii	4.9	0.78	0.4	24 41.1	18 1.7	+ 1 52.4	−0.2509	0.5809	0.0339	+ 4	−56
49 Sagittarii	5.5	0.77	0.3	24 8.5	18 7.8	+ 1 58.3	−0.8145	0.5811	0.0342	−27	−90
51 Sagittarii	5.8	0.73	0.8	24 55.1	22 24.1	+ 6 4.8	+0.1647	0.5811	0 0454	+27	−31
h Sagittarii	4.7	0.73	0.8	25 5.1	22 40.3	+ 6 20.3	+0.3498	0.5810	0.0461	+38	−21
53 Sagittarii	6.3	+0.70	+0.5	−23 38.1	23 58 0	+ 7 35.0	−1.0945	0.5810	+0.0495	−45	−90
274 B. Sagittarii	6.1	0.70	0.5	23 38.3	**10** 0 5.1	+ 7 41.8	−1.0857	0.5810	0.0498	−44	−90
308 B. Sagittarii	6.3	0.64	0.8	24 10.1	5 51.2	−10 45.3	−0.2035	0.5806	0.0648	+ 9	−53
329 B. Sagittarii	6.1	0.60	0.7	22 59.3	8 45.5	− 7 57.7	−1.2259	0.5802	0.0723	−56	−90
36 B. Capricorni	6.2	0.45	1.0	22 41.6	20 15.9	+ 3 6.4	−0.5257	0.5781	0.1013	− 4	−77
17 Capricorni	5.8	+0.36	+1.0	−21 50.7	**11** 3 7.6	+ 9 42.6	−0.6449	0.5763	+0.1179	− 9	−89
χ Capricorni	5.3	0.24	1.2	21 33.6	12 25.3	− 5 20.7	+0.2592	0.5736	0.1393	+41	−27
27 Capricorni	6.1	0.23	1.0	20 55.3	12 50.3	− 4 56.6	−0.3356	0.5735	0.1403	+ 9	−62
φ Capricorni	5.3	0.20	1.1	21 1.8	15 22.9	− 2 29.7	+0.1387	0.5725	0.1458	+35	−33
33 Capricorni	5.3	0.15	1.2	21 14.3	18 57.4	+ 0 56.9	+0.8872	0.5714	0.1536	+69	+10
128 B. Capricorni	6.5	+0.12	+0.8	−19 32.7	21 25.7	+ 3 19.7	−0.4572	0.5705	+0.1588	+ 6	−70
37 Capricorni	5.7	0.09	1.2	20 29.4	23 28.4	+ 5 18.0	+0.8364	0.5697	0.1629	+70	+ 6
ε Capricorni	4.7	0.08	1.0	19 52.4	**12** 0 25.2	+ 6 12.6	+0.3627	0.5694	0.1649	+50	−21
κ Capricorni	4.8	0.05	0.8	19 16.9	2 47.0	+ 8 29.2	+0.1537	0.5684	0.1696	+39	−32
143 B. Capricorni	6.1	+0.05	1.0	20 2.2	3 1.2	+ 8 42.9	+0.9636	0.5683	0.1701	+70	+15
154 B. Capricorni	6.1	0.00	+0.8	−19 2.8	6 37.9	−11 48.3	+0.5821	0.5670	+0.1771	+65	− 9
161 B. Capricorni	6.4	−0.06	0.6	18 20.4	11 7.9	− 7 28.2	+0.6787	0.5653	0.1855	+71	− 4
29 Aquarii (*mean*)	6.5	0.06	+0.3	17 24.2	11 15.0	− 7 21.4	−0.2520	0.5653	0.1857	+19	−56
56 Aquarii	6.1	0.21	−0.3	15 3.1	23 18.8	+ 4 16.5	−0.2699	0.5610	0.2060	+20	−57
69 Aquarii	5.6	0.30	0.4	14 32.2	**13** 6 56.9	+11 38.3	+0.8262	0.5582	0.2173	+75	+ 4
τ Aquarii	4.4	−0.32	−0.6	−14 4.4	7 46.8	−11 33.5	+0.5396	0.5580	+0.2184	+67	−12
74 Aquarii	5.8	0.34	1.2	12 6.1	9 30.2	− 9 53.7	−1.0723	0.5575	0.2208	−24	−90
257 B. Aquarii	6.3	0.37	0.7	13 33.5	12 12.0	− 7 17.6	+0.9982	0.5567	0.2243	+76	+15
290 B. Aquarii	6.3	0.45	1.4	11 11.0	18 54.5	− 0 49.1	+0.1369	0.5547	0.2323	+45	−34
ψ^1 Aquarii	4.5	0.44	1.9	9 35.0	19 26.4	− 0 18.3	−1.3486	0.5546	0.2329	−52	−90
ψ^2 Aquarii	4.6	−0.46	−1.9	− 9 40.8	20 21.2	+ 0 34.5	−1.0389	0.5544	+0.2339	−20	−90

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

MAY.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1909.0.		Apparent Declination.	Washington Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
		$\Delta\alpha$	$\Delta\delta$								
		s	″	° ′	d h m	h m				°	°
ψ^3 Aquarii	5.2	−0.47	−1.8	−10 6.5	**13** 20 49.4	+ 1 1.8	−0.4973	0.5543	+0.2344	+12	−72
336 B. Aquarii	6.3	0.52	1.8	9 46.0	**14** 1 19.6	+ 5 22.7	+0.2253	0.5533	0.2390	+51	−29
351 B. Aquarii	6.5	0.55	2.4	7 58.1	4 15.3	+ 8 12.4	−0.8766	0.5526	0.2416	− 8	−90
376 B. Aquarii	6.3	0.61	2.7	6 53.2	10 6.8	−10 8.2	−0.5310	0.5514	0.2465	+12	−74
30 Piscium	4.7	0.67	2.7	6 31.2	16 10.5	− 4 16.9	+0.6095	0.5507	0.2507	+78	− 9
33 Piscium	4.7	−0.69	−2.7	− 6 13.0	17 42.3	− 2 48.3	+0.6904	0.5505	+0.2516	+84	− 5
24 B. Ceti	6.0	0.71	2.8	5 45.3	19 57.5	− 0 37.6	+0.7954	0.5503	0.2528	+84	+ 1
54 B. Ceti	6.3	0.78	3.6	2 43.4	**15** 2 23.4	+ 5 35.1	−0.6009	0.5499	0.2557	+ 9	−80
14 Ceti	5.4	0.82	4.0	− 1 0.4	7 23.8	+10 25.2	−1.0325	0.5499	0.2571	−17	−90
26 Ceti	6.0	0.93	4.1	+ 0 52.7	20 12.9	− 1 11.8	+0.3929	0.5507	0.2581	+64	−20
33 Ceti	6.1	−0.96	−4.3	+ 1 57.6	23 16.0	+ 1 45.0	+0.1000	0.5511	+0.2577	+47	−34
f Piscium	5.1	0.99	4.4	3 8.1	**16** 2 32.1	+ 4 54.5	−0.2302	0.5516	0.2570	+29	−54
117 G. Piscium	6.5	1.02	4.3	3 3.7	6 38.0	+ 8 52.0	+0.8928	0.5524	0.2558	+90	+ 8
μ Piscium	5.0	1.03	4.8	5 40.4	8 5.3	+10 16.3	−1.3423	0.5526	0.2553	−46	−84
ν Piscium	4.6	1.07	−4.5	5 1.6	13 9.4	− 8 50.0	+0.5924	0.5538	0.2529	+79	− 9
				NEW	*MOON.*						
132 Tauri	5.0	−1.23	+1.4	+24 32.3	**20** 21 23.6	− 4 25.5	−0.2730	0.5828	+0.0698	+26	−36
412 B. Tauri	5.8	1.20	1.6	24 14.2	**21** 0 36.4	− 1 20.0	+0.2497	0.5825	0.0614	+56	− 7
5 Geminorum	5.9	1.16	2.0	24 26.5	6 31.8	+ 4 21.8	+0.3558	0.5817	0.0457	+64	0
8 Geminorum	6.1	−1.14	+2.1	+24 0.0	8 28.9	+ 6 14.4	+0.9003	0.5813	+0.0406	+90	+31
9 Geminorum	6.2	1.13	2.1	23 46.4	8 45.2	+ 6 30.0	+1.1487	0.5813	0.0399	+90	+50
52 B. Geminorum	6.5	1.06	2.8	24 40.1	17 5.9	− 9 28.4	+0.4581	0.5792	0.0178	+72	+ 8
ε Geminorum	3.2	1.04	3.0	25 13.4	19 44.8	− 6 55.5	−0.0857	0.5784	+0.0109	+36	−20
37 Geminorum	5.7	1.00	3.4	25 29.5	**22** 0 26.1	− 2 24.8	−0.3458	0.5766	−0.0013	+21	−34
39 Geminorum	6.2	−0.99	+3.7	+26 12.1	1 52.0	− 1 2.2	−1.0997	0.5761	−0.0050	−30	−64
40 Geminorum	6.3	0.98	3.6	26 2.4	2 8.6	− 0 46.1	−0.9298	0.5759	0.0057	−15	−64
ω Geminorum	5.2	0.95	3.3	24 20.8	3 23.7	+ 0 26.1	+0.8447	0.5754	0.0089	+90	+31
48 Geminorum	5.8	0.91	3.5	24 17.0	7 34.2	+ 4 27.2	+0.8551	0.5736	0.0196	+90	+31
52 Geminorum	6.1	0.90	3.7	25 2.7	8 29.9	+ 5 20.9	+0.0302	0.5732	0.0219	+43	−15
A Geminorum	5.1	−0.86	+3.9	+25 13.6	12 11.0	+ 8 53.8	−0.2609	0.5714	−0.0312	+26	−31
176 B. Geminorum	6.3	0.78	4.1	24 33.9	18 26.4	− 9 4.6	+0.1980	0.5679	0.0465	+53	− 5
181 B. Geminorum	6.0	0.78	4.0	24 25.8	18 51.1	− 8 40.8	+0.3228	0.5676	0.0474	+61	− 2
κ Geminorum	3.6	0.76	4.2	24 37.1	21 5.5	− 6 31.2	+0.0110	0.5665	0.0528	+42	−19
82 Geminorum	6.3	0.73	3.9	23 22.1	22 52.5	− 4 48.1	+1.2457	0.5653	0.0570	+90	+59
5 B. Cancri	6.4	−0.66	+4.2	+23 50.1	**23** 4 14.9	+ 0 22.7	+0.4095	0.5620	−0.0694	+68	+ 1
4 Cancri	6.2	0.67	4.7	25 20.5	4 32.1	+ 0 39.3	−1.2220	0.5619	0.0701	−44	−65
9 Cancri	6.2	0.63	4.0	22 53.8	6 34.1	+ 2 37.0	+1.2469	0.5606	0.0747	+90	+58
35 B. Cancri	6.4	0.59	4.2	23 24.8	9 48.1	+ 5 44.1	+0.4420	0.5585	0.0819	+70	+ 1
λ Cancri	5.9	0.56	4.6	24 18.6	12 48.5	+ 8 38.2	−0.7775	0.5564	0.0884	− 4	−66
28 Cancri	6.1	−0.52	+4.7	+24 26.9	16 24.2	−11 53.6	−1.2591	0.5540	−0.0960	−49	−66
γ Cancri	4.9	0.43	4.0	21 47.8	23 3.7	− 5 27.8	+0.9135	0.5493	0.1095	+90	+25
ξ Cancri	5.2	0.28	4.4	22 24.9	**24** 11 5.1	+ 6 9.4	−1.2100	0.5408	0.1320	−38	−68
79 Cancri	6.1	0.27	4.4	22 22.1	11 32.9	+ 6 36.3	−1.2199	0.5404	0.1328	−40	−68
90 H′. Cancri	6.1	0.25	4.2	21 39.6	13 6.0	+ 8 6.4	−0.6597	0.5392	0.1355	+ 4	−66
57 B. Leonis	6.5	−0.06	+3.3	+19 17.0	**25** 3 57.9	− 1 30.2	−0.2679	0.5289	−0.1593	+26	−45
η Leonis	3.6	+0.06	2.5	17 12.4	15 19.4	+ 9 30.1	+0.1042	0.5216	0.1750	+47	−27
42 Leonis	6.1	0.14	1.8	15 26.1	22 42.5	− 7 20.1	+0.7254	0.5170	0.1841	+90	+ 5
46 Leonis	5.8	0.20	1.5	14 36.3	**26** 4 3.0	− 2 9.1	+0.6400	0.5140	0.1901	+86	− 1
k Leonis	5.5	0.28	+1.4	14 40.5	11 28.7	+ 5 3.5	−0.8800	0.5101	0.1978	− 7	−76
ι Leonis	4.1	+0.49	−0.3	+11 1.8	**27** 7 32.9	+ 0 33.3	−1.0043	0.5018	−0.2146	−15	−79
ω Virginis	5.4	0.55	1.2	8 38.3	15 30.2	+ 8 17.3	−0.0850	0.4995	0.2198	+36	−43
ξ Virginis	4.8	0.59	1.2	8 45.8	19 15.1	+11 56.1	−1.0521	0.4984	0.2219	−18	−81
ν Virginis	4.2	0.59	1.9	7 2.3	19 34.5	−11 45.1	+0.7854	0.4984	0.2220	+90	+ 2
A^1 Virginis	5.1	0.60	1.3	8 45.1	20 42.5	−10 39.0	−1.3618	0.4982	0.2226	−51	−81
π Virginis	4.6	+0.66	−1.9	+ 7 7.3	**28** 3 52.4	− 3 40.8	−1.1655	0.4968	−0.2260	−27	−83

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

MAY.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1909.0.		Apparent Declination.	Washington Mean Time.	Hour Angle, *H*	*Y*	*x'*	*y'*	N.	S.
		Δα	Δδ								
		s	″	° ′	d h m	h m				°	°
36 B. Virginis	6.5	+0.67	−2.3	+ 6 4.0	**28** 5 28.4	− 2 7.4	−0.3596	0.4966	−0.2268	+22	−61
c Virginis	5.1	0.74	3.2	3 49.1	14 42.9	+ 6 52.0	+0.0164	0.4958	0.2300	+42	−40
250 B. Virginis	5.9	0.83	3.8	+ 2 21.3	**29** 0 44.9	− 7 22.4	−0.6839	0.4957	0.2323	+ 5	−87
65 Virginis	6.0	1.03	5.9	− 4 27.0	**30** 1 37.4	− 7 10.6	+1.0261	0.4997	0.2323	+86	+16
66 Virginis	5.7	1.04	6.0	4 41.4	2 17.5	− 6 31.6	+1.1347	0.4998	0.2321	+85	+24
l Virginis	4.8	+1.06	−6.2	− 5 47.3	6 21.4	− 2 34.6	+1.3984	0.5009	−0.2313	+84	+60
80 Virginis	5.6	1.08	6.0	4 56.1	8 17.8	− 0 41.3	+0.0119	0.5017	0.2309	+41	−40
566 B. Virginis	6.4	1.12	6.0	5 2.5	12 51.3	+ 3 44.5	−0.9183	0.5032	0.2295	−10	−90
88 Virginis	6.5	1.14	6.3	6 23.1	15 13.3	+ 6 2.5	+0.0130	0.5041	0.2287	+41	−40
598 B. Virginis	6.1	1.16	6.6	7 36.8	18 48.6	+ 9 31.8	+0.5403	0.5056	0.2273	+72	−13
623 B. Virginis	6.5	+1.20	−6.8	− 8 49.4	23 48.6	− 9 36.8	+0.7321	0.5078	−0.2249	+80	− 2
95 Virginis	5.4	1.21	6.8	8 52.9	**31** 1 4.1	− 8 23.4	+0.5140	0.5084	0.2243	+70	−14
96 Virginis	6.5	1.22	7.0	9 54.3	2 16.2	− 7 13.4	+1.3641	0.5090	0.2237	+80	+52
κ Virginis	4.2	1.24	6.9	9 51.1	4 19.5	− 5 13.7	+0.8467	0.5099	0.2225	+80	+ 5
2 Libræ	6.3	1.28	7.2	11 18.0	9 50.4	+ 0 7.7	+1.2068	0.5128	0.2192	+79	+31
4 G. Libræ	6.5	+1.28	−7.1	−11 15.5	10 30.0	+ 0 46.1	+1.0166	0.5131	−0.2187	+79	+16
6 B. Libræ	6.2	1.31	6.9	11 55.2	16 54.9	+ 6 59.7	+0.3473	0.5168	0.2139	+57	−23
22 B. Libræ	6.4	1.37	7.0	12 27.5	22 26.6	−11 38.5	−0.2380	0.5201	0.2093	+24	−55
μ Libræ	5.4	1.38	7.2	13 46.3	23 8.7	−10 57.7	+1.0401	0.5205	0.2087	+76	+18

JUNE.

Name.	Mag.	Δα	Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle, *H*	*Y*	*x'*	*y'*	N.	S.
o Libræ	6.2	+1.48	−6.8	−15 13.3	**1** 14 53.8	+ 4 18.4	−0.5566	0.5311	−0.1922	+ 5	−78
32 Libræ	5.9	1.51	6.8	16 24.1	18 23.6	+ 7 41.7	+0.0499	0.5336	0.1879	+36	−38
34 Libræ	6.0	1.52	6.7	16 18.0	19 33.6	+ 8 49.4	−0.2785	0.5344	0.1864	+19	−57
ζ Libræ	5.6	+1.52	−6.7	−16 32.8	20 38.4	+ 9 52.2	−0.2128	0.5352	−0.1850	+22	−53
47 Libræ	5.8	1.59	6.4	19 7.0	**2** 7 3.9	− 4 2.6	+0.6914	0.5429	0.1702	+71	− 3
β^1 Scorpii	2.9	1.62	6.1	19 33.5	11 53.9	+ 0 37.8	+0.3591	0.5465	0.1626	+50	−21
56 B. Scorpii	5.0	1.62	6.1	19 33.3	11 54.2	+ 0 38.1	+0.3545	0.5465	0.1626	+50	−22
ω^1 Scorpii	4.3	1.63	6.1	20 25.5	12 31.0	+ 1 13.7	+1.1851	0.5470	0.1615	+70	+34
ν Scorpii	3.9	+1.62	−5.9	−19 13.6	14 55.0	+ 3 32.9	−0.4786	0.5487	−0.1575	+ 5	−72
84 B. Scorpii	6.3	1.65	5.9	20 52.7	16 1.6	+ 4 37.1	+1.1108	0.5496	0.1557	+69	+27
51 G. Scorpii	6.5	1.65	5.8	21 4.8	17 9.6	+ 5 42.9	+1.1495	0.5504	0.1537	+69	+31
58 G. Scorpii	6.2	1.65	5.7	19 59.9	18 9.1	+ 6 40.4	−0.1560	0.5511	0.1520	+21	−50
ψ Ophiuchi	4.6	1.65	5.5	19 49.6	20 24.4	+ 8 51.1	−0.6764	0.5528	0.1480	− 7	−90
ω Ophiuchi	4.5	+1.68	−5.3	−21 16.4	23 59.1	−11 41.7	+0.3467	0.5554	−0.1414	+47	−22
123 B. Scorpii	6.5	1.68	5.0	20 14.0	**3** 3 45.2	− 8 3.4	−1.2782	0.5582	0.1342	−56	−90
24 Ophiuchi	5.5	1.73	4.4	23 0.5	10 49.2	− 1 14.3	+0.7672	0.5631	0.1199	+67	+ 3
39 Ophiuchi	5.1	1.75	3.5	24 11.4	19 55.3	+ 7 32.1	+1.0109	0.5691	0.1001	+66	+20
191 B. Ophiuchi	6.3	1.75	3.2	24 9.7	22 55.6	+10 25.8	+0.6904	0.5709	0.0932	+65	− 2
b Ophiuchi	4.4	+1.75	−3.3	−24 5.6	23 27.9	+10 57.0	+0.5683	0.5713	−0.0919	+56	− 9
51 Ophiuchi	4.8	1.75	3.0	23 53.6	**4** 1 35.7	−10 59.9	+0.1672	0.5725	0.0869	+31	−31
63 Ophiuchi	6.1	1.75	2.0	24 52.2	11 21.9	− 1 35.5	+0.4573	0.5777	0.0632	+46	−15
4 Sagittarii	4.8	1.73	1.9	23 48.5	13 24.0	+ 0 21.9	−0.7785	0.5786	0.0581	−22	−90
7 Sagittarii	5.5	1.74	1.7	24 17.0	14 39.0	+ 1 34.1	−0.3527	0.5792	0.0549	+ 1	−64
9 Sagittarii	6.0	+1.74	−1.6	−24 21.8	15 4.2	+ 1 58.4	−0.2905	0.5794	−0.0538	+ 4	−59
1 Sagittarii	5.2	1.72	1.4	23 43.2	18 17.8	+ 5 4.6	−1.1228	0.5807	0.0456	−47	−90
67 B. Sagittarii	6.4	1.74	0.9	25 38.4	21 6.5	+ 7 46.9	+0.7655	0.5818	0.0382	+64	+ 4
70 B. Sagittarii	6.4	1.73	0.8	24 57.4	22 16.3	+ 8 54.0	+0.0094	0.5822	0.0352	+18	−40
λ Sagittarii	2.9	1.72	0.6	25 28.4	**5** 0 53.0	+11 24.6	+0.4647	0.5831	0.0283	+44	−15
24 Sagittarii	5.7	+1.70	−0.4	−24 6.1	3 18.2	−10 15.8	−1.0266	0.5838	−0.0219	−42	−90
26 Sagittarii	6.1	1.68	−0.1	23 55.1	6 31.4	− 7 9.9	−1.2718	0.5846	0.0133	−66	−90
126 B. Sagittarii	5.7	1.69	+0.2	25 6.2	7 42.0	− 6 2.1	−0.0526	0.5849	−0.0101	+12	−44
162 B. Sagittarii	6.4	1.66	0.7	24 59.9	13 8.3	− 0 48.4	−0.1762	0.5859	+0.0046	+ 5	−52
127 G. Sagittarii	6.4	1.66	0.9	25 4.1	13 58.0	− 0 0.7	−0.0982	0.5860	0.0068	+10	−47
172 B. Sagittarii	5.8	+1.65	+0.9	−24 58.4	14 47.7	+ 0 47.1	−0.1918	0.5861	+0.0090	+ 5	−53

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JUNE.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1909.0. Δα	Red'ns from 1909.0. Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle, H	Y	x′	y′	N.	S.
		s	″	° ′	d h m	h m				°	°
189 B. Sagittarii	6.1	+1.63	+1.2	−24 48.0	5 17 6.8	+ 3 0.8	−0.3427	0.5863	+0.0154	− 2	−63
ψ Sagittarii	4.8	1.63	1.6	25 24.8	20 1.6	+ 5 48.8	+0.3504	0.5866	0.0233	+36	−21
208 B. Sagittarii	6.1	1.61	1.4	24 20.1	20 2.8	+ 5 50.0	−0.7677	0.5866	0.0233	−25	−90
χ Sagittarii	4.9	1.58	1.8	24 41.1	23 56.2	+ 9 34.2	−0.2924	0.5866	0.0339	+ 2	−59
49 Sagittarii	5.5	1.58	1.8	24 8.4	**6** 0 2.2	+ 9 40.1	−0.8528	0.5866	0.0341	−29	−90
51 Sagittarii	5.8	+1.55	+2.4	−24 55.1	4 14.5	−10 17.4	+0.1195	0.5864	+0.0455	+25	−34
h Sagittarii	4.7	1.55	2.4	25 5.1	4 30.5	−10 2.1	+0.3036	0.5864	0.0462	+35	−24
53 Sagittarii	6.3	1.52	2.2	23 38.1	5 47.0	− 8 48.5	−1.1333	0.5863	0.0497	−48	−90
274 B. Sagittarii	6.1	1.52	2.2	23 38.2	5 54.0	− 8 41.8	−1.1247	0.5863	0.0500	−47	−90
308 B. Sagittarii	6.3	1.48	2.7	24 10.0	11 35.2	− 3 13.9	−0.2490	0.5856	0.0652	+ 7	−56
329 B. Sagittarii	6.1	+1.44	+2.9	−22 59.2	14 27.1	− 0 28.6	−1.2675	0.5851	+0.0727	−62	−90
36 B. Capricorni	6.2	1.33	3.8	22 41.6	**7** 1 49.1	+10 27.0	−0.5738	0.5822	0.1018	− 7	−82
17 Capricorni	5.8	1.25	4.3	21 50.6	8 36.9	− 7 0.8	−0.6945	0.5798	0.1185	−12	−90
χ Capricorni	5.3	1.14	4.8	21 33.5	17 50.4	+ 1 51.7	+0.2063	0.5760	0.1398	+38	−30
27 Capricorni	6.1	1.13	4.6	20 55.3	18 15.2	+ 2 15.6	−0.3878	0.5758	0.1408	+ 7	−65
φ Capricorni	5.3	+1.10	+4.8	−21 1.7	20 47.1	+ 4 41.8	+0.0855	0.5747	+0.1463	+32	−36
33 Capricorni	5.3	1.06	5.1	21 14.3	**8** 0 20.6	+ 8 7.5	+0.8335	0.5730	0.1540	+69	+ 6
128 B. Capricorni	6.5	1.02	4.8	19 32.6	2 48.4	+10 29.8	−0.5107	0.5719	0.1592	+ 3	−75
37 Capricorni	5.7	1.00	5.2	20 29.3	4 50.8	−11 32.4	+0.7828	0.5709	0.1633	+70	+ 3
ι Capricorni	4.7	0.98	5.1	19 52.4	5 47.4	−10 37.8	+0.3090	0.5705	0.1652	+47	−24
κ Capricorni	4.8	+0.95	+5.1	−19 16.8	8 9.0	− 8 21.5	+0.0998	0.5693	+0.1699	+36	−35
143 B. Capricorni	6.1	0.95	5.3	20 2.1	8 23.2	− 8 7.8	+0.9104	0.5692	0.1703	+70	+11
154 B. Capricorni	6.1	0.90	5.2	19 2.8	11 59.8	− 4 39.1	+0.5288	0.5674	0.1772	+61	−12
161 B. Capricorni	6.4	0.84	5.2	18 20.4	16 30.2	− 0 18.5	+0.6260	0.5651	0.1855	+68	− 7
29 Aquarii (*mean*)	6.5	0.83	4.9	17 24.1	16 37.2	− 0 11.8	−0.3066	0.5651	0.1357	+16	−59
56 Aquarii	6.1	+0.67	+4.7	−15 3.0	**9** 4 44.2	+11 29.3	−0.3247	0.5592	+0.2055	+18	−60
69 Aquarii	5.6	0.57	4.8	14 32.1	12 26.1	− 5 5.1	+0.7774	0.5556	0.2164	+75	+ 1
τ Aquarii	4.4	0.56	4.7	14 4.3	13 16.5	− 4 16.4	+0.4894	0.5553	0.2175	+64	−15
74 Aquarii	5.8	0.53	4.1	12 6.0	15 0.9	− 2 35.6	−1.1309	0.5545	0.2198	−29	−90
257 B. Aquarii	6.3	0.50	4.7	13 33.4	17 44.5	+ 0 2.3	+0.9514	0.5534	0.2231	+76	+12
290 B. Aquarii	6.3	+0.40	+4.1	−11 10.9	**10** 0 32.1	+ 6 35.9	+0.0863	0.5507	+0.2308	+42	−36
ψ² Aquarii	4.6	0.38	3.6	9 40.7	2 0.1	+ 8 0.8	−1.0974	0.5502	0.2323	−24	−90
ψ³ Aquarii	5.2	0.38	3.7	10 6.4	2 28.7	+ 8 28.5	−0.5519	0.5500	0.2328	+ 9	−76
336 B. Aquarii	6.3	0.32	3.7	9 45.9	7 3.1	−11 6.4	+0.1767	0.5484	0.2371	+48	−32
351 B. Aquarii	6.5	0.28	3.2	7 58.0	10 1.8	− 8 13.8	−0.9334	0.5475	0.2397	−12	−90
376 B. Aquarii	6.3	+0.21	+3.0	− 6 53.1	15 59.7	− 2 28.0	−0.5841	0.5458	+0.2443	+ 9	−79
30 Piscium	4.7	0.13	2.9	6 31.1	22 10.7	+ 3 30.6	+0. 687	0.5445	0.2481	+75	−11
33 Piscium	4.7	0.11	2.9	6 12.9	23 44.5	+ 5 1.3	+0.6508	0.5442	0.2490	+82	− 7
24 B. Ceti	6.0	+0.09	2.8	5 45.2	**11** 2 2.7	+ 7 14.9	+0.7576	0.5438	0.2501	+84	− 1
54 B. Ceti	6.3	0.00	1.8	2 43.3	8 37.5	−10 23.3	−0.6511	0.5429	0.2527	+ 7	−85
14 Ceti	5.4	−0.05	+1.3	− 1 0.3	13 45.2	− 5 25.8	−1.0862	0.5425	+0.2540	−20	−90
26 Ceti	6.0	0.20	1.0	+ 0 52.8	**12** 2 54.4	+ 7 17.3	+0.3600	0.5426	0.2547	+62	−22
33 Ceti	6.1	0.24	0.7	1 57.7	6 2.5	+10 19.1	+0.0648	0.5429	0.2543	+45	−37
f Piscium	5.1	0.28	0.4	3 8.1	9 24.0	−10 26.1	−0.2684	0.5433	0.2535	+27	−56
117 G. Piscium	6.5	0.32	0.5	3 3.8	13 36.8	− 6 21.7	+0.8701	0.5440	0.2523	+90	+ 6
ν Piscium	4.6	−0.39	+0.1	+ 5 1.6	20 19.2	+ 0 7.3	+0.5687	0.5453	+0.2494	+77	−10
39 B. Arietis	6.5	0.49	−0.4	7 18.0	**13** 7 2.6	+10 29.3	+0.9125	0.5482	0.2427	+90	+10
64 Ceti	5.8	0.53	0.6	8 8.6	10 0.3	−10 39.1	+0.7732	0.5491	0.2403	+90	+ 2
ξ¹ Ceti	4.5	0.53	0.6	8 25.2	10 44.8	− 9 56.1	+0.6719	0.5494	0.2397	+88	− 4
ξ Arietis	5.5	0.58	0.9	10 11.9	16 4.7	− 4 47.1	+0.1369	0.5513	0.2349	+49	−31
25 Arietis	6.5	−0.60	−0.8	+ 9 47.7	17 15.5	− 3 38.7	+0.8224	0.5517	+0.2337	+90	+ 6
31 Arietis	5.7	0.62	1.2	12 3.2	21 21.7	+ 0 19.0	−0.5159	0.5533	0.2294	+14	−68
38 Arietis	5.2	0.66	1.1	12 3.8	**14** 1 5.4	+ 3 55.0	+0.3217	0.5548	0.2252	+60	−20
145 B. Arietis	6.5	0.74	1.6	15 30.1	9 47.4	−11 41.2	−1.2595	0.5586	0.2139	−39	−74
26 B. Tauri	6.4	0.84	1.5	17 32.1	22 35.6	+ 0 39.8	0.7128	0.5644	0.1942	+ 2	−72
33 B. Tauri	6.3	−0.84	−1.0	+16 14.5	**15** 0 53.4	+ 2 52.6	+1.0473	0.5655	+0.1903	+90	+26

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JUNE.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1909.0. Δα	Red'ns from 1909.0. Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
		s	"	° '	d h m	h m				°	°
				NEW	MOON.						
82 Geminorum	6.3	−0.80	+3.8	+23 22.1	**19** 7 55.3	+ 6 2.6	+1.2446	0.5691	−0.0574	+90	+59
5 B. Cancri	6.4	0.76	4.1	23 50.1	13 14.8	+11 10.5	+0.4099	0.5660	0.0700	+68	+ 1
4 Cancri	6.2	0.77	4.4	25 20.5	13 31.8	+11 26.9	−1.2173	0.5659	0.0706	−43	−65
9 Cancri	6.2	−0.74	+4.0	+22 53.8	15 32.6	−10 36.6	+1.2448	0.5647	−0.0753	+90	+58
35 B. Cancri	6.4	0.72	4.2	23 24.8	18 44.6	− 7 31.5	+0.4418	0.5626	0.0825	+70	+ 1
λ Cancri	5.9	0.70	4.5	24 18.6	21 43.1	− 4 39.3	−0.7741	0.5607	0.0892	− 3	−66
28 Cancri	6.1	0.67	4.6	24 26.9	**20** 1 16.4	− 1 13.5	−1.2542	0.5583	0.0968	−48	−66
γ Cancri	4.9	0.60	4.3	21 47.8	7 51.4	+ 5 7.8	+0.9105	0.5537	0.1105	+90	+25
ξ Cancri	5.2	−0.48	+4.7	+22 24.9	19 44.2	− 7 23.6	−1.2066	0.5451	−0.1331	−38	−68
79 Cancri	6.1	0.48	4.7	22 22.1	20 11.8	− 6 56.9	−1.2165	0.5448	0.1340	−39	−68
90 H'. Cancri	6.1	0.46	4.6	21 39.6	21 43.7	− 5 28.0	−0.6586	0.5437	0.1368	+ 4	−66
57 B. Leonis	6.5	0.31	4.1	19 17.0	**21** 12 25.0	+ 8 44.6	−0.2707	0.5329	0.1607	+26	−45
107 B. Leonis	6.3	0.20	3.3	16 12.1	22 50.6	− 5 9.3	+1.3393	0.5256	0.1754	+90	+63
η Leonis	3.6	−0.20	+3.6	+17 12.5	23 39.0	− 4 22.5	+0.0980	0.5251	−0.1764	+46	−27
42 Leonis	6.1	0.12	3.1	15 26.1	**22** 6 57.5	+ 2 42.7	+0.7157	0.5203	0.1855	+90	+ 4
46 Leonis	5.8	−0.07	2.8	14 36.3	12 15.0	+ 7 50.7	+0.6296	0.5170	0.1914	+84	− 2
k Leonis	5.5	0.00	2.8	14 40.6	19 36.9	− 9 0.5	−0.8869	0.5126	0.1990	− 8	−75
ι Leonis	4.1	+0.21	1.4	11 1.9	**23** 15 33.7	+10 22.0	−1.0156	0.5030	0.2153	−16	−79
ω Virginis	5.4	+0.28	+0.6	+ 8 38.3	23 29.2	− 5 55.8	−0.0998	0.5001	−0.2202	+36	−44
ξ Virginis	4.8	0.32	+0.6	8 45.8	**24** 3 13.5	− 2 17.8	−1.0664	0.4989	0.2222	−19	−81
ν Virginis	4.2	0.31	−0.1	7 2.4	3 32.9	− 1 58.9	+0.7686	0.4988	0.2224	+90	+ 1
*A*¹ Virginis	5.1	0.33	+0.6	8 45.1	4 40.7	− 0 52.9	−1.3760	0.4985	0.2230	−54	−81
π Virginis	4.6	0.40	−0.1	7 7.3	11 50.1	+ 6 4.6	−1.1817	0.4967	0.2262	−28	−83
36 B. Virginis	6.5	+0.41	−0.5	+ 6 4.0	13 26.0	+ 7 37.9	−0.3769	0.4964	−0.2268	+21	−62
c Virginis	5.1	0.49	1.4	3 49.1	22 41.0	− 7 22.2	−0.0027	0.4949	0.2297	+41	−41
250 B. Virginis	5.9	0.59	2.0	+ 2 21.3	**25** 8 44.2	+ 2 24.7	−0.7046	0.4943	0.2317	+ 4	−88
65 Virginis	6.0	0.83	4.4	− 4 27.0	**26** 9 43.8	+ 2 43.5	+1.0046	0.4971	0.2312	+86	+14
66 Virginis	5.7	0.85	4.5	4 41.4	10 24.2	+ 3 22.8	+1.1134	0.4973	0.2311	+85	+22
l Virginis	4.8	+0.88	−4.9	− 5 47.2	14 29.7	+ 7 21.6	+1.3774	0.4984	−0.2301	+84	+53
80 Virginis	5.6	0.90	4.5	4 56.0	16 26.9	+ 9 15.5	−0.0109	0.4990	0.2296	+40	−42
566 B. Virginis	6.4	0.94	4.6	5 2.5	21 2 2	−10 16.8	−0.9424	0.5004	0.2282	−11	−90
88 Virginis	6.5	0.97	5.0	6 23.1	23 25.1	− 7 58.0	−0.0098	0.5013	0.2274	+40	−42
598 B. Virginis	6.1	1.00	5.4	7 36.8	**27** 3 1.9	− 4 27.1	+0.5183	0.5027	0.2259	+71	−14
623 B. Virginis	6.5	+1.06	−5.7	− 8 49.3	8 4.1	+ 0 26.5	+0.7106	0.5049	−0.2236	+81	− 3
95 Virginis	5.4	1.07	5.7	8 52.9	9 20.1	+ 1 40.4	+0.4921	0.5055	0.2230	+68	−15
96 Virginis	6.5	1.09	6.0	9 54.3	10 32.6	+ 2 50.8	+1.3435	0.5060	0.2223	+80	+48
κ Virginis	4.2	1.11	5.9	9 51.1	12 36.8	+ 4 51.5	+0.8254	0.5070	0.2212	+80	+ 4
2 Libræ	6.3	1.16	6.4	11 18.0	18 10.1	+10 15.3	+1.1864	0.5099	0.2178	+79	+29
4 G. Libræ	6.5	+1.17	−6.3	−11 15.5	18 49.9	+10 53.9	+0.9960	0.5103	−0.2174	+79	+15
6 B. Libræ	6.2	1.21	6.2	11 55.2	**28** 1 17.3	− 6 50.1	+0.3266	0.5140	0.2127	+56	−24
22 B. Libræ	6.4	1.30	6.4	12 27.5	6 51.1	− 1 26.2	−0.2586	0.5175	0.2081	+23	−56
μ Libræ	5.4	1.31	6.7	13 46.3	7 33.4	− 0 45.1	+1.0206	0.5179	0.2075	+76	+17
o Libræ	6.2	1.48	6.5	15 13.3	23 23.1	− 9 24.5	−0.5739	0.5290	0.1913	+ 4	−79
32 Libræ	5.9	+1.52	−6.6	−16 24.1	**29** 2 53.6	− 6 0.5	+0.0333	0.5317	−0.1870	+35	−39
34 Libræ	6.0	1.53	6.5	16 18.0	4 3.9	− 4 52.5	−0.2947	0.5326	0.1856	+18	−58
ζ Libræ	5.6	1.54	6.6	16 32.8	5 8.8	− 3 49.7	−0.2287	0.5334	0.1842	+21	−54
47 Libræ	5.8	1.66	6.6	19 7.0	15 35.5	+ 6 16.8	+0.6772	0.5417	0.1695	+70	− 4
β¹ Scorpii	2.9	1.71	6.3	19 33.5	20 25.5	+10 57.2	+0.3466	0.5457	0.1621	+49	−22
56 B. Scorpii	5.0	+1.71	−6.3	−19 33.3	20 25.8	+10 57.5	+0.3420	0.5457	−0.1620	+49	−22
ω¹ Scorpii	4.3	1.72	6.5	20 25.5	21 2.6	+11 33.1	+1.1713	0.5462	0.1610	+70	+32
ν Scorpii	3.9	1.73	6.0	19 13.6	23 26.5	−10 7.8	−0.4887	0.5482	0.1571	+ 4	−73
84 B. Scorpii	6.3	1.75	6.3	20 52 7	**30** 0 33.0	− 9 3.6	+1.0979	0.5490	0.1552	+69	+26
51 G. Scorpii	6.5	1.77	6.2	21 4.8	1 40.9	− 7 57.9	+1.1367	0.5499	0.1533	+69	+29
58 G. Scorpii	6.2	+1.77	−5.9	−19 59.9	2 40.4	− 7 0.5	−0.1655	0.5508	−0.1516	+21	−51

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1909.0. Δα	Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle, *H*	*Y*	*x′*	*y′*	N.	S.
		s	″	° ′	d h m	h m				°	°
					JUNE.						
ψ Ophiuchi	4.6	+1.78	−5.8	−19 49.6	30 4 55.4	− 4 50.1	−0.6839	0.5526	−0.1476	− 7	−90
ω Ophiuchi	4.5	1.83	5.7	21 16.4	8 29.4	− 1 23.5	+0.3377	0.5556	0.1410	+46	−22
123 B. Scorpii	6.5	1.85	5.2	20 14.0	12 14.7	+ 2 14.0	−1.2808	0.5586	0.1340	−57	−90
24 Ophiuchi	5.5	1.94	5.0	23 0.5	19 16.6	+ 9 1.0	+0.7600	0.5642	0.1198	+67	+ 2
					JULY.						
39 Ophiuchi	5.1	+2.02	−4.2	−24 11.4	1 4 18.9	− 6 16.5	+1.0054	0.5710	−0.1000	+66	+20
191 B. Ophiuchi	6.3	2.04	3.9	24 9.7	7 17.7	− 3 24.3	+0.6874	0.5732	0.0931	+64	− 2
b Ophiuchi	4.4	2.04	3.9	24 5.6	7 49.6	− 2 53.5	+0.5661	0.5736	0.0919	+56	− 9
51 Ophiuchi	4.8	+2.05	−3.5	−23 53.6	9 56.2	− 0 51.7	+0.1680	0.5750	−0.0869	+31	−31
63 Ophiuchi	6.1	2.12	2.5	24 52.2	19 36.0	+ 8 26.3	+0.4603	0.5811	0.0631	+46	−15
4 Sagittarii	4.8	2.11	2.2	23 48.5	21 36.6	+10 22.2	−0.7666	0.5823	0.0580	−22	−90
7 Sagittarii	5.5	2.12	2.0	24 17.0	22 50.6	+11 33.5	−0.3429	0.5830	0.0548	+ 1	−63
9 Sagittarii	6.0	2.13	1.9	24 21.8	23 15.4	+11 57.3	−0.2810	0.5832	0.0537	+ 4	−58
1 Sagittarii	5.2	+2.13	−1.5	−23 43.2	2 2 26.4	− 8 59.0	−1.1059	0.5849	−0.0454	−46	−90
67 B. Sagittarii	6.4	2.17	1.3	25 38.4	5 12.7	− 6 19.1	+0.7701	0.5862	0.0381	+64	+ 4
70 B. Sagittarii	6.4	2.16	1.0	24 57.4	6 21.5	− 5 13.1	+0.0202	0.5867	0.0350	+19	−40
λ Sagittarii	2.9	2.18	0.8	25 28.4	8 55.8	− 2 44.7	+0.4733	0.5878	0.0281	+45	−14
24 Sagittarii	5.7	2.16	−0.4	24 6.1	11 18.7	− 0 27.4	−1.0054	0.5887	0.0216	−40	−90
26 Sagittarii	6.1	+2.16	0.0	−23 55.1	14 28.7	+ 2 35.2	−1.2467	0.5898	−0.0129	−62	−90
126 B. Sagittarii	5.7	2.18	+0.2	25 6.2	15 38.2	+ 3 41.9	−0.0368	0.5902	−0.0097	+13	−43
162 B. Sagittarii	6.4	2.18	0.9	24 59.9	20 58.7	+ 8 49.7	−0.1566	0.5916	+0.0051	+ 6	−50
127 G. Sagittarii	6.4	2.19	1.1	25 4.1	21 47.5	+ 9 36.6	−0.0790	0.5918	0.0074	+11	−46
172 B. Sagittarii	5.8	2.18	1.1	24 58.4	22 36.2	+10 23.4	−0.1712	0.5920	0.0097	+ 6	−51
189 B. Sagittarii	6.1	+2.18	+1.5	−24 48.0	3 0 52.8	−11 25.5	−0.3196	0.5924	+0.0160	− 1	−61
ψ Sagittarii	4.8	2.19	1.9	25 24.8	3 44.2	− 8 40.9	+0.3687	0.5928	0.0241	+37	−20
208 B. Sagittarii	6.1	2.18	1.8	24 20.1	3 45.4	− 8 39.7	−0.7392	0.5928	0.0241	−23	−90
χ Sagittarii	4.9	2.17	2.4	24 41.1	7 34.2	− 5 0.1	−0.2661	0.5931	0.0348	+ 3	−57
49 Sagittarii	5.5	2.16	2.4	24 8.4	7 40.1	− 4 54.3	−0.8212	0.5931	0.0351	−27	−90
51 Sagittarii	5.8	+2.17	+3.0	−24 55.1	11 47.3	− 0 57.0	+0.1441	0.5932	+0.0466	+26	−33
h Sagittarii	4.7	2.17	3.0	25 5.1	12 2.9	− 0 42.0	+0.3266	0.5932	0.0473	+37	−22
53 Sagittarii	6.3	2.14	3.1	23 38.1	13 17.8	+ 0 29.9	−1.0957	0.5932	0.0508	−45	−90
274 B. Sagittarii	6.1	2.14	3.1	23 38.2	13 24.7	+ 0 36.5	−1.0872	0.5932	0.0511	−44	−90
308 B. Sagittarii	6.3	2.13	3.7	24 10.0	18 58.6	+ 5 57.1	−0.2169	0.5928	0.0665	+ 9	−54
329 B. Sagittarii	6.1	+2.10	+4.2	−22 59.2	21 46.8	+ 8 38.7	−1.2236	0.5924	+0.0742	−55	−90
36 B. Capricorni	6.2	2.04	5.6	22 41.5	4 8 53.6	− 4 40.8	−0.5305	0.5897	0.1037	− 4	−77
17 Capricorni	5.8	1.99	6.3	21 50.6	15 32.1	+ 1 42.1	−0.6461	0.5874	0.1206	− 9	−89
χ Capricorni	5.3	1.91	7.3	21 33.5	5 0 33.0	+10 21.9	+0.2505	0.5836	0.1422	+41	−27
27 Capricorni	6.1	1.90	7.2	20 55.2	0 57.3	+10 45.3	−0.3373	0.5834	0.1432	+10	−62
φ Capricorni	5.3	+1.88	+7.5	−21 1.7	3 25.7	−10 52.0	+0.1327	0.5822	+0.1488	+35	−33
33 Capricorni	5.3	1.85	7.9	21 14.2	6 54.4	− 7 31.3	+0.8752	0.5804	0.1565	+69	+ 9
128 B. Capricorni	6.5	1.81	7.9	19 32.6	9 19.0	− 5 12.2	−0.4542	0.5792	0.1617	+ 6	−70
37 Capricorni	5.7	1.80	8.3	20 29.3	11 18.6	− 3 17.1	+0.8277	0.5781	0.1659	+70	+ 6
ε Capricorni	4.7	1.79	8.2	19 52.3	12 14.0	− 2 23.8	+0.3591	0.5776	0.1678	+50	−21
κ Capricorni	4.8	+1.77	+8.3	−19 16.7	14 32.6	− 0 10.4	+0.1532	0.5764	+0.1725	+39	−32
143 B. Capricorni	6.1	1.77	8.5	20 2.1	14 46.5	+ 0 2.9	+0.9561	0.5763	0.1730	+70	+14
152 B. Capricorni	6.5	1.71	8.2	17 16.1	17 42.7	+ 2 52.6	−1.3211	0.5746	0.1787	−59	−90
154 B. Capricorni	6.1	1.73	8.6	19 2.7	18 18.5	+ 3 27.0	+0.5803	0.5743	0.1799	+65	− 9
161 B. Capricorni	6.4	1.67	8.8	18 20.3	22 43.3	+ 7 42.0	+0.6791	0.5718	0.1881	+71	− 4
29 Aquarii (*mean*)	6.5	+1.66	+8.7	−17 24.1	22 50.2	+ 7 48.7	−0.2449	0.5717	+0.1884	+20	−55
56 Aquarii	6.1	1.51	9.0	15 2.9	6 10 43.3	− 4 44.2	−0.2569	0.5650	0.2081	+21	−56
69 Aquarii	5.6	1.43	9.4	14 32.0	18 17.3	+ 2 33.5	+0.8406	0.5609	0.2189	+75	+ 5
τ Aquarii	4.4	1.41	9.3	14 4.2	19 6.8	+ 3 21.2	+0.5552	0.5604	0.2200	+69	−11
74 Aquarii	5.8	1.38	8.9	12 5.9	20 49.6	+ 5 0.4	−1.0532	0.5595	0.2221	−22	−90
257 B. Aquarii	6.3	+1.36	+9.4	−13 33.3	23 30.8	+ 7 36.0	+1.0163	0.5581	+0.2254	+76	+16

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JULY.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1909.0. Δα	Red'ns from 1909.0. Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle, *H*	*Y*	*x′*	*y′*	N.	S.
		s	″	° ′	d h m	h m				°	°
290 B. Aquarii	6.3	+1.27	+9.1	−11 10.8	7 6 12.8	− 9 56.0	+0.1599	0.5548	+0.2328	+46	−32
ψ^1 Aquarii	4.5	1.27	8.6	9 34.9	6 44.8	− 9 25.1	−1.3271	0.5545	0.2334	−48	−90
ψ^2 Aquarii	4.6	1.24	8.6	9 40.6	7 39.7	− 8 32.1	−1.0166	0.5541	0.2343	−18	−90
ψ^3 Aquarii	5.2	1.24	8.8	10 6.4	8 8.0	− 8 4.8	−0.4741	0.5539	0.2347	+13	−70
336 B. Aquarii	6.3	1.19	9.0	9 45.9	12 39.2	− 3 42.9	+0.2523	0.5518	0.2389	+53	−28
351 B. Aquarii	6.5	+1.14	+8.5	− 7 57.9	15 36.0	− 0 52.2	−0.8518	0.5506	+0.2414	− 7	−90
376 B. Aquarii	6.3	1.07	8.4	6 53.0	21 30.8	+ 4 50.5	−0.5026	0.5483	0.2456	+13	−72
30 Piscium	4.7	1.00	8.4	6 31.0	8 3 39.4	+10 46.7	+0.6485	0.5462	0.2491	+81	− 7
33 Piscium	4.7	0.98	8.5	6 12.9	5 12.7	−11 43.1	+0.7309	0.5457	0.2499	+84	− 2
24 B. Ceti	6.0	0.95	8.3	5 45.1	7 30.2	− 9 30.3	+0.8383	0.5450	0.2509	+84	+ 4
54 B. Ceti	6.3	+0.86	+7.4	− 2 43.2	14 3.8	− 3 9.8	−0.5670	0.5434	+0.2530	+11	−77
14 Ceti	5.4	0.81	7.0	− 1 0.2	19 11.2	+ 1 47.5	−1.0018	0.5424	0.2541	−14	−90
26 Ceti	6.0	0.65	6.6	+ 0 52.9	9 8 22.3	− 9 27.4	+0.4453	0.5410	0.2539	+68	−18
33 Ceti	6.1	0.61	6.2	1 57.8	11 31.4	− 6 24.6	+0.1494	0.5410	0.2533	+49	−33
f Piscium	5.1	0.57	5.8	3 8.2	14 54.2	− 3 8.5	−0.1847	0.5410	0.2524	+31	−51
117 G. Piscium	6.5	+0.52	+5.9	+ 3 3.9	19 8.9	+ 0 57.8	+0.9570	0.5412	+0.2509	+90	+12
μ Piscium	5.0	0.52	5.0	5 40.6	20 39.4	+ 2 25.4	−1.3135	0.5413	0.2502	−41	−84
ν Piscium	4.6	0.45	5.3	5 1.7	10 1 55.1	+ 7 30.6	+0.6540	0.5419	0.2477	+85	− 6
39 B. Arietis	6.5	0.33	4.6	7 18.0	12 46.2	− 5 59.9	+0.9979	0.5438	0.2405	+90	+16
64 Ceti	5.8	0.29	4.3	8 8.7	15 46.4	− 3 5.7	+0.8572	0.5445	0.2380	+90	+ 7
ξ^1 Ceti	4.5	+0.28	+4.3	+ 8 25.3	16 31.6	− 2 22.0	+0.7551	0.5447	+0.2373	+90	+ 1
ξ Arietis	5.5	0.23	3.7	10 12.0	21 56.4	+ 2 52.0	+0.2149	0.5462	0.2324	+53	−27
25 Arietis	6.5	0.20	3.8	9 47.8	23 8.3	+ 4 1.4	+0.9048	0.5465	0.2312	+90	+11
31 Arietis	5.7	0.18	3.1	12 3.3	11 3 18.6	+ 8 3.3	−0.4447	0.5478	0.2268	+17	−63
38 Arietis	5.2	0.13	3.2	12 3.9	7 6.2	+11 43.3	+0.3974	0.5491	0.2225	+65	−16
145 B. Arietis	6.5	+0.04	+2.1	+15 30.2	15 57.9	− 3 43.2	−1.2011	0.5525	+0.2111	−33	−74
26 B. Tauri	6.4	−0.09	1.6	17 32.1	12 5 1.4	+ 8 53.0	−0.6581	0.5578	0.1914	+ 5	−71
33 B. Tauri	6.3	0.11	2.2	16 14.5	7 22.1	+11 8.8	+1.1164	0.5588	0.1874	+90	+32
163 B. Tauri	5.8	0.20	1.9	17 56.3	16 39.4	− 3 53.7	+1.0367	0.5628	0.1708	+90	+28
43 Tauri	5.5	0.23	1.6	19 22.2	20 14.6	− 0 26.2	+0.1600	0.5644	0.1639	+50	−22
ω Tauri	4.8	−0.27	+1.4	+20 21.3	23 42.7	+ 2 54.5	−0.3024	0.5658	+0.1570	+24	−46
51 Tauri	5.6	0.27	1.1	21 21.5	13 0 10.3	+ 3 21.0	−1.2667	0.5660	0.1561	−45	−69
53 Tauri	5.3	0.27	1.2	20 55.4	0 37.8	+ 3 47.5	−0.7459	0.5662	0.1552	− 1	−69
224 B. Tauri	6.1	0.28	1.4	20 36.4	1 53.8	+ 5 0.8	−0.2246	0.5667	0.1526	+28	−41
227 B. Tauri	5.9	0.29	1.3	20 46.3	2 23.3	+ 5 29.2	−0.3192	0.5669	0.1516	+23	−46
247 B. Tauri	5.8	−0.30	+1.2	+21 25.1	4 16.9	+ 7 18.7	−0.7057	0.5677	+0.1477	+ 2	−68
129 H′. Tauri	5.8	0.33	1.6	20 30.2	8 39.4	+11 31.6	+0.8679	0.5694	0.1383	+90	+20
τ Tauri	4.5	0.35	1.1	22 47.0	10 18.2	−10 53.2	−1.2729	0.5700	0.1347	−49	−67
ι Tauri	4.7	0.40	1.6	21 27.7	19 5.6	− 2 25.2	+1.1988	0.5729	0.1148	+90	+48
108 Tauri	6.2	0.45	1.6	22 10.9	14 0 15.0	+ 2 32.7	+1.0110	0.5744	0.1027	+90	+33
121 Tauri	5.1	−0.50	+1.5	+23 58.8	8 31.7	+10 30.9	−0.0986	0.5762	+0.0824	+35	−27
394 B. Tauri	6.0	0.51	1.8	23 9.7	11 48.2	−10 20.0	+1.0143	0.5768	0.0742	+90	+36
132 Tauri	5.0	0.53	1.6	24 32.3	14 8.1	− 8 5.3	−0.2600	0.5770	0.0684	+26	−35
412 B. Tauri	5.8	0.54	1.8	24 14.2	17 24.8	− 4 56.0	+0.2658	0.5774	+0.0600	+57	− 6
				NEW	*MOON.*						
57 B. Leonis	6.5	−0.37	+4.0	+19 17.0	18 20 35.4	− 5 17.1	−0.3591	0.5349	−0.1623	+21	−51
107 B. Leonis	6.3	0.30	3.6	16 12.1	19 6 58.9	+ 4 46.7	+1.2397	0.5278	0.1770	+90	+44
η Leonis	3.6	0.30	3.8	17 12.5	7 47.1	+ 5 33.4	−0.0022	0.5273	0.1780	+41	−33
42 Leonis	6.1	0.25	3.5	15 26.1	15 3.9	−11 23.1	+0.6078	0.5225	0.1872	+82	− 2
46 Leonis	5.8	−0.21	+3.3	+14 36.3	20 20.1	− 6 16.5	+0.5164	0.5192	−0.1932	+74	− 8
k Leonis	5.5	−0.16	3.3	14 40.6	20 3 40.2	+ 0 50.5	−1.0067	0.5148	0.2006	−16	−75
ι Leonis	4.1	0.00	2.4	11 1.9	23 32.6	− 3 51.4	−1.1536	0.5047	0.2168	−26	−79
ω Virginis	5.4	+0.05	1.7	8 38.3	21 7 26.9	+ 3 49.6	−0.2440	0.5015	0.2215	+28	−53
ξ Virginis	4.8	0.08	1.7	8 45.9	11 10.8	+ 7 27.3	−1.2136	0.5002	0.2234	−31	−81
ν Virginis	4.2	+0.08	+1.1	+ 7 2.4	11 30.1	+ 7 46.1	+0.6217	0.5000	−0.2236	+82	− 7

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JULY.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1909.0.		Apparent Declination.	Washington Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
		$\Delta\alpha$	$\Delta\delta$								
		s	″	° ′	d h m	h m				°	°
π Virginis	4.6	+0.15	+1.2	+ 7 7.3	**21** 19 46.7	− 8 11.0	−1.3353	0.4976	−0.2271	−45	−83
36 B. Virginis	6.5	0.16	0.8	6 4.0	21 22.6	− 6 37.7	−0.5308	0.4971	0.2277	+13	−73
ι Virginis	5.1	0.23	+0.1	3 49.2	**22** 6 37.6	+ 2 22.2	−0.1615	0.4952	0.2303	+32	−50
250 B. Virginis	5.9	0.32	−0.5	+ 2 21.3	16 42.0	−11 49.8	−0.8693	0.4940	0.2319	− 6	−88
65 Virginis	6.0	0.55	2.9	− 4 27.0	**23** 17 48.8	−11 23.7	+0.8388	0.4952	0.2304	+86	+ 4
66 Virginis	5.7	+0.57	−3.0	− 4 41.4	18 29.5	−10 44.1	+0.9480	0.4954	−0.2302	+85	+11
l Virginis	4.8	0.60	3.4	5 47.2	22 36.8	− 6 43.5	+1.2131	0.4962	0.2292	+84	+30
80 Virginis	5.6	0.62	3.0	4 56.0	**24** 0 34.9	− 4 48.7	−0.1802	0.4967	0.2287	+31	−51
566 B. Virginis	6.4	0.66	3.1	5 2.5	5 12.6	− 0 18.6	−1.1151	0.4979	0.2271	−23	−90
88 Virginis	6.5	0.69	3.6	6 23.1	7 36.8	+ 2 1.7	−0.1785	0.4986	0.2261	+30	−51
598 B. Virginis	6.1	+0.72	−4.0	− 7 36.7	11 15.7	+ 5 34.5	+0.3524	0.4998	−0.2246	+60	−22
623 B. Virginis	6.5	0.78	4.4	8 49.3	16 20.9	+10 31.1	+0.5468	0.5017	0.2221	+72	−12
95 Virginis	5.4	0.79	4.4	8 52.8	17 37.7	+11 45.8	+0.3276	0.5022	0.2214	+58	−24
96 Virginis	6.5	0.81	4.7	9 54.3	18 51.0	−11 3.0	+1.1833	0.5027	0.2207	+80	+29
κ Virginis	4.2	0.84	4.7	9 51.1	20 56.6	− 9 1.0	+0.6636	0.5036	0.2196	+79	− 6
2 Libræ	6.3	+0.90	−5.2	−11 18.0	**25** 2 33.6	− 3 33.4	+1.0285	0.5062	−0.2160	+79	+17
4 G. Libræ	6.5	0.91	5.2	11 15.5	3 13.9	− 2 54.3	+0.8374	0.5065	0.2155	+79	+ 4
6 B. Libræ	6.2	0.95	5.1	11 55.2	9 46.0	+ 3 26.5	+0.1678	0.5100	0.2107	+46	−32
22 B. Libræ	6.4	1.05	5.4	12 27.5	15 24.0	+ 8 54.6	−0.4174	0.5132	0.2061	+15	−66
μ Libræ	5.4	1.06	5.8	13 46.3	16 6.8	+ 9 36.2	+0.8688	0.5136	0.2054	+76	+ 7
o Libræ	6.2	+1.25	−5.8	−15 13.3	**26** 8 9.1	+ 1 9.4	−0.7231	0.5243	−0.1890	− 4	−90
32 Libræ	5.9	1.30	6.1	16 24.1	11 42.4	+ 4 36.2	−0.1099	0.5270	0.1848	+28	−47
34 Libræ	6.0	1.32	6.0	16 18.0	12 53.6	+ 5 45.1	−0.4386	0.5279	0.1832	+11	−68
ζ Libræ	5.6	1.33	6.0	16 32.8	13 59.5	+ 6 49.0	−0.3714	0.5287	0.1819	+14	−64
47 Libræ	5.8	1.48	6.4	19 7.0	**27** 0 34.3	− 6 56.5	+0.5484	0.5370	0.1673	+63	−11
β^1 Scorpii	2.9	+1.54	−6.2	−19 33.5	5 28.0	− 2 12.4	+0.2210	0.5410	−0.1599	+42	−29
56 B. Scorpii	5.0	1.54	6.2	19 33.3	5 28.3	− 2 12.1	+0.2163	0.5410	0.1599	+42	−29
ω^1 Scorpii	4.3	1.56	6.5	20 25.5	6 5.6	− 1 36.0	+1.0499	0.5415	0.1589	+70	+21
ω^2 Scorpii	4.6	1.56	6.6	20 37.5	6 21.9	− 1 20.3	+1.2210	0.5418	0.1584	+69	+38
ν Scorpii	3.9	1.58	5.9	19 13.6	8 31.2	+ 0 44.8	−0.6149	0.5436	0.1550	− 3	−85
84 B. Scorpii	6.3	+1.60	−6.4	−20 52.7	9 38.5	+ 1 49.8	+0.9797	0.5445	−0.1531	+69	+16
51 G. Scorpii	6.5	1.62	6.4	21 4.8	10 47.2	+ 2 56.3	+1.0199	0.5455	0.1511	+69	+19
58 G. Scorpii	6.2	1.63	5.9	19 59.9	11 47.4	+ 3 54.4	−0.2870	0.5463	0.1495	+14	−58
ψ Ophiuchi	4.6	1.65	5.8	19 49.6	14 3.9	+ 6 6.3	−0.8050	0.5482	0.1455	−15	−90
ω Ophiuchi	4.5	1.71	5.9	21 16.4	17 40.4	+ 9 35.4	+0.2247	0.5513	0.1390	+40	−28
24 Ophiuchi	5.5	+1.86	−5.5	−23 0.5	**28** 4 34.1	− 3 53.5	+0.6607	0.5604	−0.1179	+64	− 4
39 Ophiuchi	5.1	1.98	4.9	24 11.4	13 40.8	+ 4 53.4	+0.9171	0.5678	0.0983	+66	+13
191 B. Ophiuchi	6.3	2.02	4.5	24 9.7	16 40.8	+ 7 46.8	+0.6022	0.5701	0.0915	+58	− 7
b Ophiuchi	4.4	2.02	4.5	24 5.6	17 13.0	+ 8 17.9	+0.4814	0.5706	0.0902	+50	−14
51 Ophiuchi	4.8	2.05	4.2	23 53.6	19 20.2	+10 20.4	+0.0853	0.5722	0.0853	+27	−36
63 Ophiuchi	6.1	+2.17	−3.2	−24 52.2	**29** 5 2.8	− 4 18.9	+0.3905	0.5791	−0.0616	+42	−19
4 Sagittarii	4.8	2.17	2.8	23 48.6	7 3.8	− 2 22.5	−0.8338	0.5804	0.0565	−26	−90
7 Sagittarii	5.5	2.19	2.7	24 17.0	8 18.0	− 1 11.1	−0.4084	0.5812	0.0533	− 2	−68
9 Sagittarii	6.0	2.20	2.7	24 21.8	8 42.8	− 0 47.3	−0.3459	0.5815	0.0522	+ 1	−63
1 Sagittarii	5.2	2.22	2.1	23 43.3	11 54.2	+ 2 16.8	−1.1657	0.5834	0.0440	−51	−90
67 B. Sagittarii	6.4	+2.27	−2.2	−25 38.4	14 40.6	+ 4 56.7	+0.7129	0.5850	−0.0366	+64	0
70 B. Sagittarii	6.4	2.28	1.9	24 57.4	15 49.4	+ 6 2.8	−0.0347	0.5856	0.0336	+15	−43
λ Sagittarii	2.9	2.30	1.7	25 28.4	18 23.7	+ 8 31.1	+0.4214	0.5870	0.0266	+41	−17
24 Sagittarii	5.7	2.30	1.0	24 6.1	20 46.5	+10 48.2	−1.0513	0.5882	0.0202	−44	−90
126 B. Sagittarii	5.7	2.35	0.6	25 6.2	**30** 1 5.5	− 9 2.8	−0.0781	0.5902	−0.0083	+11	−46
σ Sagittarii	2.3	+2.40	−0.2	−26 24.6	5 10.9	− 5 7.1	+1.2545	0.5917	+0.0032	+64	+53
162 B. Sagittarii	6.4	2.39	+0.3	24 59.9	6 24.8	− 3 56.1	−0.1896	0.5921	0.0066	+ 5	−53
127 G. Sagittarii	6.4	2.39	0.4	25 4.1	7 13.5	− 3 9.4	−0.1110	0.5924	0.0089	+ 9	−48
172 B. Sagittarii	5.8	2.39	0.4	24 58.4	8 2.0	− 2 22.8	−0.2017	0.5927	0.0112	+ 5	−53
189 B. Sagittarii	6.1	2.40	0.9	24 48.0	10 17.8	− 0 12.4	−0.3460	0.5934	0.0176	− 2	−63
ψ Sagittarii	4.8	+2.43	+1.2	−25 24.8	13 8.2	+ 2 31.2	+0.3439	0.5941	+0.0256	+36	−21

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JULY.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1909.0.		Apparent Declination.	Washington Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
		$\Delta\alpha$	$\Delta\delta$								
		s	"	° ′	d h m	h m				°	°
208 B. Sagittarii	6.1	+2.42	+ 1.3	−24 20.1	30 13 9.3	+ 2 32.2	−0.7594	0.5941	+0.0257	−24	−90
χ Sagittarii	4.9	2.44	1.9	24 41.1	16 56.5	+ 6 10.3	−0.2823	0.5949	0.0364	+ 3	−58
49 Sagittarii	5.5	2.43	2.0	24 8.4	17 2.4	+ 6 16.0	−0.8346	0.5949	0.0367	−27	−90
51 Sagittarii	5.8	2.46	2.6	24 55.1	21 7.4	+10 11.2	+0.1325	0.5955	0.0484	+26	−33
h Sagittarii	4.7	2.47	2.6	25 5.1	21 22.9	+10 26.0	+0.3144	0.5955	0.0491	+36	−23
53 Sagittarii	6.3	+2.44	+ 2.9	−23 38.1	22 37.1	+11 37.2	−1.0982	0.5956	+0.0526	−45	−90
274 B. Sagittarii	6.1	2.44	2.9	23 38.2	22 43.9	+11 43.7	−1.0895	0.5956	0.0529	−44	−90
308 B. Sagittarii	6.3	2.47	3.5	24 10.0	31 4 14.3	− 6 59.2	−0.2150	0.5959	0.0684	+ 9	−54
329 B. Sagittarii	6.1	2.46	4.3	22 59.2	7 0.5	− 4 19.6	−1.2103	0.5958	0.0762	−54	−90
336 B. Sagittarii	6.5	2.45	4.4	22 51.0	7 55.3	− 3 27.1	−1.2775	0.5957	0.0788	−64	−90
36 B. Capricorni	6.2	+2.46	+ 5.9	−22 41.5	17 57.8	+ 6 11.3	−0.5032	0.5943	+0.1062	− 3	−75
AUGUST.											
17 Capricorni	5.8	+2.45	+ 6.9	−21 50.6	1 0 29.6	−11 32.5	−0.6065	0.5927	+0.1233	− 6	−85
η Capricorni	4.8	+2.40	+ 7.9	−20 12.8	7 42.5	− 4 36.8	−1.2850	0.5903	+0.1415	−58	−90
χ Capricorni	5.3	2.42	8.2	21 33.4	9 20.3	− 3 2.9	+0.2967	0.5897	0.1454	+44	−24
27 Capricorni	6.1	2.42	8.2	20 55.2	9 44.0	− 2 40.1	−0.2844	0.5895	0.1463	+13	−58
φ Capricorni	5.3	2.41	8.6	21 1.6	12 9.4	− 0 20.4	+0.1848	0.5885	0.1521	+38	−31
33 Capricorni	5.3	2.40	9.0	21 14.2	15 33.7	+ 2 56.0	+0.9250	0.5871	0.1600	+69	+12
128 B. Capricorni	6.5	+2.36	+ 9.3	−19 32.6	17 55.0	+ 5 11.7	−0.3859	0.5860	+0.1653	+ 9	−65
37 Capricorni	5.7	2.37	9.6	20 29.3	19 52.0	+ 7 4.2	+0.8850	0.5851	0.1696	+70	+ 9
ε Capricorni	4.7	2.36	9.7	19 52.3	20 46.2	+ 7 56.3	+0.4233	0.5847	0.1716	+54	−18
κ Capricorni	4.8	2.34	10.0	19 16.7	23 1.5	+10 6.4	+0.2235	0.5836	0.1763	+43	−29
143 B. Capricorni	6.1	2.35	10.0	20 2.0	23 15.1	+10 19.4	+1.0175	0.5835	0.1768	+70	+19
152 B. Capricorni	6.5	+2.30	+10.2	−17 16.0	2 2 7.1	−10 55.3	−1.2280	0.5820	+0.1827	−44	−90
154 B. Capricorni	6.1	2.32	10.4	19 2.7	2 42.1	−10 21.6	+0.6517	0.5817	0.1839	+69	− 5
161 B. Capricorni	6.4	2.29	10.8	18 20.3	7 0.4	− 6 13.1	+0.7565	0.5795	0.1923	+72	+ 1
29 Aquarii (*mean*)	6.5	2.27	10.8	17 24.0	7 7.1	− 6 6.6	−0.1561	0.5794	0.1925	+24	−50
56 Aquarii	6.1	2.17	11.7	15 2.9	18 41.8	+ 5 2.0	−0.1485	0.5732	0.2126	+27	−50
69 Aquarii	5.6	+2.11	+12.3	−14 32.0	3 2 3.6	−11 52.5	+0.9465	0.5691	+0.2237	+75	+12
τ Aquarii	4.4	2.09	12.3	14 4.2	2 51.8	−11 6.0	+0.6661	0.5687	0.2247	+75	− 5
74 Aquarii	5.8	2.06	12.2	12 5.8	4 31.7	− 9 29.8	−0.9183	0.5679	0.2270	−13	−90
257 B. Aquarii	6.3	2.06	12.6	13 33.3	7 8.5	− 6 58.6	+1.1280	0.5665	0.2302	+76	+25
290 B. Aquarii	6.3	1.98	12.7	11 10.8	13 39.5	− 0 41.8	+0.2928	0.5631	0.2378	+54	−26
ψ^1 Aquarii	4.5	+1.98	+12.4	− 9 34.8	14 10.6	− 0 11.8	−1.1736	0.5629	+0.2383	−31	−90
ψ^2 Aquarii	4.6	1.96	12.5	9 40.6	15 4.0	+ 0 39.8	−0.8661	0.5624	0.2392	− 8	−90
ψ^3 Aquarii	5.2	1.96	12.6	10 6.3	15 31.5	+ 1 6.2	−0.3300	0.5622	0.2396	+21	−60
336 B. Aquarii	6.3	1.92	12.8	9 45.8	19 55.3	+ 5 20.8	+0.3932	0.5601	0.2438	+61	−20
351 B. Aquarii	6.5	1.88	12.6	7 57.9	22 47.3	+ 8 6.6	−0.6924	0.5588	0.2462	+ 3	−90
376 B. Aquarii	6.3	+1.82	+12.7	− 6 52.9	4 4 32.4	−10 20.3	−0.3402	0.5563	+0.2503	+22	−61
30 Piscium	4.7	1.77	12.9	6 31.0	10 31.2	− 4 33.9	+0.8035	0.5540	0.2538	+83	+ 2
33 Piscium	4.7	1.75	12.9	6 12.8	12 2.1	− 3 6.1	+0.8867	0.5534	0.2545	+84	+ 7
24 B. Ceti	6.0	1.73	12.9	5 45.0	14 16.0	− 0 56.9	+0.9955	0.5526	0.2555	+84	+14
54 B. Ceti	6.3	1.65	12.3	2 43.1	20 39.6	+ 5 13.6	−0.3858	0.5506	0.2574	+21	−64
MARS	. .	. .	. .	− 2 41.8	23 6.4	+ 7 35.4	+0.2225	0.5421	+0.2561	+54	−30
14 Ceti	5.4	+1.60	+11.9	− 1 0.1	5 1 39.6	+10 3.4	−0.8109	0.5493	0.2581	− 2	−90
26 Ceti	6.0	1.47	11.6	+ 0 53.0	14 32.9	− 1 29.5	+0.6306	0.5469	0.2573	+83	− 8
33 Ceti	6.1	1.43	11.4	1 57.9	17 38.2	+ 1 29.6	+0.3397	0.5466	0.2565	+61	−23
f Piscium	5.1	1.40	11.0	3 8.3	20 57.0	+ 4 41.7	+0.0106	0.5463	0.2554	+42	−40
117 G. Piscium	6.5	+1.36	+11.1	+ 3 4.0	6 1 7.0	+ 8 43.4	+1.1441	0.5461	+0.2536	+90	+25
μ Piscium	5.0	1.35	10.2	5 40.7	2 35.8	+10 9.2	−1.1059	0.5461	0.2528	−22	−84
ν Piscium	4.6	1.28	10.4	5 1.8	7 46.3	− 8 50.7	+0.8469	0.5462	0.2500	+90	+ 5
39 B. Arietis	6.5	1.18	9.6	7 18.1	18 28.0	+ 1 29.3	+1.1916	0.5469	0.2419	+90	+31
64 Ceti	5.8	1.14	9.4	8 8.8	21 26.1	+ 4 21.4	+1.0522	0.5473	0.2393	+90	+20
ξ^1 Ceti	4.5	+1.14	+ 9.2	+ 8 25.4	22 10.7	+ 5 4.5	+0.9507	0.5474	+0.2385	+90	+13

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

AUGUST.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1909.0.		Apparent Declination.	Washington Mean Time.	Hour Angle, *H*	*Y*	*x′*	*y′*	N.	S.
		Δα	Δδ								
		s	″	° ′	d h m	h m				°	°
ξ Arietis	5.5	+1.08	+8.6	+10 12.1	7 3 32.2	+10 15.1	+0.4136	0.5483	+0.2332	+66	−17
25 Arietis	6.5	1.06	8.6	9 47.8	4 43.4	+11 23.9	+1.0999	0.5485	0.2319	+90	+25
31 Arietis	5.7	1.04	7.8	12 3.3	8 51.6	− 8 36.3	−0.2440	0.5494	0.2272	+28	−51
38 Arietis	5.2	0.99	7.8	12 3.9	12 37.6	− 4 58.0	+0.5937	0.5502	0.2226	+80	− 6
145 B. Arietis	6.5	0.90	6.4	15 30.3	21 26.6	+ 3 32.8	−1.0041	0.5526	0.2108	−16	−74
26 B. Tauri	6.4	+0.77	+5.4	+17 32.2	8 10 29.1	− 7 51.9	−0.4712	0.5566	+0.1903	+16	−60
33 B. Tauri	6.3	0.74	5.9	16 14.6	12 50.0	− 5 35.9	+1.3012	0.5574	0.1863	+90	+52
163 B. Tauri	5.8	0.65	5.2	17 56.4	22 8.9	+ 3 23.2	+1.2152	0.5605	0.1692	+90	+43
43 Tauri	5.5	0.61	4.6	19 22.2	9 1 45.1	+ 6 51.7	+0.3344	0.5617	0.1623	+61	−13
ω Tauri	4.8	0.57	4.2	20 21.4	5 14.5	+10 13.7	−0.1323	0.5629	0.1553	+34	−36
51 Tauri	5.6	+0.58	+3.9	+21 21.5	5 42.2	+10 40.3	−1.0990	0.5630	+0.1544	−26	−69
53 Tauri	5.3	0.57	4.0	20 55.4	6 9.9	+11 7.0	−0.5776	0.5632	0.1534	+ 9	−62
56 Tauri	5.2	0.57	3.8	21 33.3	6 13.9	+11 10.9	−1.2221	0.5632	0.1533	−39	−68
224 B. Tauri	6.1	0.55	4.1	20 36.5	7 26.3	−11 39.3	−0.0566	0.5636	0.1509	+38	−32
227 B. Tauri	5.9	0.55	4.0	20 46.3	7 56.1	−11 10.6	−0.1518	0.5637	0.1498	+33	−37
67 B. Tauri	5.4	+0.55	+3.6	+21 59.6	8 43.1	−10 25.3	−1.3030	0.5640	+0.1482	−55	−68
247 B. Tauri	5.8	0.53	3.9	21 25.1	9 50.5	− 9 20.4	−0.5413	0.5644	0.1458	+11	−59
129 H′. Tauri	5.8	0.48	4.0	20 30.2	14 15.0	− 5 5.4	+1.0320	0.5657	0.1364	+90	+31
τ Tauri	4.5	0.47	3.3	22 47.0	15 54.7	− 3 29.3	−1.1171	0.5662	0.1328	−28	−67
103 Tauri	5.5	0.36	2.7	24 8.8	10 2 51.9	+ 7 3.9	−1.2237	0.5690	0.1080	−42	−66
108 Tauri	6.2	+0.33	+3.3	+22 10.9	6 0.1	+10 5.2	+1.1585	0.5698	+0.1006	+90	+46
121 Scorpii	5.1	0.25	2.7	23 58.8	14 22.7	− 5 50.7	+0.0331	0.5713	0.0804	+43	−20
394 B. Tauri	6.0	0.22	2.8	23 9.7	17 41.8	− 2 39.0	+1.1473	0.5717	0.0722	+90	+48
132 Tauri	5.0	0.20	2.5	24 32.3	20 3.5	− 0 22.5	−0.1369	0.5720	0.0664	+33	−28
412 B. Tauri	5.8	0.17	2.5	24 14.3	23 22.9	+ 2 49.4	+0.3871	0.5721	0.0581	+66	+ 1
5 Geminorum	5.9	+0.12	+2.4	+24 26.5	11 5 29.7	+ 8 42.7	+0.4811	0.5724	+0.0427	+74	+ 7
8 Geminorum	6.1	0.10	2.5	24 0.0	7 30.3	+10 38.8	+1.0288	0.5724	0.0376	+90	+40
52 B. Geminorum	6.5	0.03	2.3	24 40.1	16 21.7	− 4 49.4	+0.5584	0.5718	0.0151	+81	+14
ε Geminorum	3.2	+0.02	2.3	25 13.4	19 4.6	− 2 12.5	+0.0009	0.5715	+0.0083	+41	−15
37 Geminorum	5.7	−0.02	2.2	25 29.4	23 52.2	+ 2 24.5	−0.2743	0.5707	−0.0039	+25	−30
39 Geminorum	6.2	−0.03	+2.0	+26 12.1	12 1 20.1	+ 3 49.1	−1.0405	0.5704	−0.0076	−24	−64
40 Geminorum	6.3	0.03	2.0	26 2.3	1 36.9	+ 4 5.4	−0.8692	0.5704	0.0083	−11	−64
ω Geminorum	5.2	0.04	2.4	24 20.8	2 53.6	+ 5 19.2	+0.9222	0.5701	0.0115	+90	+35
48 Geminorum	5.8	0.06	2.4	24 16.9	7 8.9	+ 9 25.2	+0.9208	0.5690	0.0221	+90	+34
52 Geminorum	6.1	0.07	2.2	25 2.7	8 5.6	+10 19.8	+0.0850	0.5687	0.0244	+46	−12
A Geminorum	5.1	−0.10	+2.2	+25 13.6	11 50.4	−10 3.6	−0.2189	0.5676	−0.0337	+28	−29
176 B. Geminorum	6.3	0.12	2.3	24 33.9	18 11.2	− 3 56.5	+0.2270	0.5654	0.0490	+55	− 7
181 B. Geminorum	6.0	0.12	2.4	24 25.8	18 36.2	− 3 32.4	+0.3516	0.5652	0.0500	+63	− 1
κ Geminorum	3.6	0.13	2.3	24 37.0	20 52.1	− 1 21.5	+0.0310	0.5644	0.0554	+43	−18
82 Geminorum	6.3	0.14	2.6	23 22.0	22 40.3	+ 0 22.9	+1.2697	0.5636	0.0596	+90	+63
5 B. Cancri	6.4	−0.16	+2.5	+23 50.1	13 4 5.6	+ 5 36.7	+0.4117	0.5613	−0.0722	+68	0
4 Cancri	6.2	0.16	2.3	25 20.5	4 23.0	+ 5 53.5	−1.2309	0.5611	0.0729	−45	−65
9 Cancri	6.2	0.17	2.7	22 53.8	6 25.8	+ 7 52.0	+1.2470	0.5602	0.0775	+90	+58
				NEW	*MOON.*						
ι Leonis	4.1	−0.10	+2.3	+11 1.9	17 6 50.8	+ 5 14.4	−1.3105	0.5054	−0.2188	−43	−79
ω Virginis	5.4	0.08	1.9	8 38.3	14 45.4	−11 4.3	−0.4137	0.5023	0.2235	+19	−63
ξ Virginis	4.8	0.06	1.9	8 45.9	18 29.3	− 7 26.6	−1.3916	0.5010	0.2254	−60	−81
ν Virginis	4.2	0.06	1.5	7 2.4	18 48.7	− 7 7.7	+0.4463	0.5009	0.2256	+68	−16
36 B. Virginis	6.5	−0.02	1.3	6 4.0	18 4 41.5	+ 2 28.9	−0.7249	0.4979	0.2296	+ 3	−84
c Virginis	5.1	+0.03	+0.8	+ 3 49.2	13 57.0	+11 29.3	−0.3695	0.4958	−0.2320	+22	−62
250 B. Virginis	5.9	0.09	+0.4	+ 2 21.3	19 0 2.1	− 2 42.0	−1.0933	0.4944	0.2334	−20	−88
65 Virginis	6.0	0.26	−1.6	− 4 26.9	20 1 13.5	− 2 11.3	+0.5914	0.4947	0.2312	+78	−10
66 Virginis	5.7	0.27	1.7	4 41.3	1 54.4	− 1 31.5	+0.7004	0.4947	0.2310	+85	− 4
72 Virginis	6.1	0.29	2.1	6 0.1	5 10.9	+ 1 39.6	+1.4006	0.4952	0.2300	+84	+61
l Virginis	4.8	+0.29	−2.1	− 5 47.2	6 2.9	+ 2 30.3	+0.9633	0.4954	−0.2297	+84	+11

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

AUGUST.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1909.0.		Apparent Declination.	Washington Mean Time.	Hour Angle, *H*	Y	x'	y'	N.	S.
		Δα	Δδ								
		s	"	° ′	d h m	h m				°	°
80 Virginis	5.6	+0.32	−1.8	− 4 56.0	**20** 8 1.7	+ 4 25.8	−0.4372	0.4957	−0.2291	+18	−67
566 B. Virginis	6.4	0.35	1.9	5 2.5	12 41.1	+ 8 57.6	−1.3798	0.4967	0.2274	−54	−90
88 Virginis	6.5	0.37	2.3	6 23.1	15 6.3	+11 18.9	−0.4406	0.4972	0.2262	+17	−68
598 B. Virginis	6.1	0.40	2.6	7 36.7	18 46.8	− 9 6.7	+0.0907	0.4982	0.2246	+45	−36
623 B. Virginis	6.5	0.45	3.1	8 49.3	23 54.5	− 4 7.5	+0.2837	0.4998	0.2219	+55	−26
95 Virginis	5.4	+0.46	−3.1	− 8 52.8	**21** 1 12.0	− 2 52.2	+0.0629	0.5002	−0.2212	+43	−38
96 Virginis	6.5	0.47	3.4	9 54.3	2 26.0	− 1 40.3	+0.9229	0.5006	0.2204	+80	+ 9
κ Virginis	4.2	0.49	3.3	9 51.1	4 32.7	+ 0 22.9	+0.3995	0.5014	0.2191	+62	−20
2 Libræ	6.3	0.55	3.9	11 18.0	10 13.1	+ 5 53.8	+0.7653	0.5036	0.2153	+79	0
4 G. Libræ	6.5	0.55	3.9	11 15.5	10 53.8	+ 6 33.3	+0.5730	0.5039	0.2149	+72	−11
6 B. Libræ	6.2	+0.59	−3.8	−11 55.2	17 30.5	−11 1.3	−0.1018	0.5069	−0.2097	+32	−47
22 B. Libræ	6.4	0.68	4.2	12 27.5	23 12.7	− 5 29.0	−0.6912	0.5097	0.2048	0	−90
μ Libræ	5.4	0.69	4.6	13 46.3	23 56.1	− 4 46.8	+0.6043	0.5100	0.2042	+72	− 9
ν Libræ	5.3	0.80	5.3	15 54.4	**22** 8 52.7	+ 3 54.0	+1.1558	0.5151	0.1954	+74	+28
ο Libræ	6.2	0.88	4.9	15 13.3	16 12.6	+11 0.8	−0.9962	0.5197	0.1873	−21	−90
32 Libræ	5.9	+0.93	−5.2	−16 24.1	19 49.4	− 9 29.0	−0.3765	0.5220	−0.1829	+14	−64
34 Libræ	6.0	0.94	5.1	16 17.9	21 1.8	− 8 18.9	−0.7074	0.5228	0.1813	− 4	−90
ζ Libræ	5.6	0.96	5.2	16 32.8	22 8.7	− 7 14.1	−0.6391	0.5236	0.1800	0	−86
λ Libræ	4.9	1.10	6.1	19 53.8	**23** 8 5.8	+ 2 24.4	+1.2793	0.5306	0.1664	+70	+45
47 Libræ	5.8	1.10	5.8	19 7.0	8 55.0	+ 3 12.1	+0.2955	0.5312	0.1652	+47	−25
β^1 Scorpii	2.9	+1.17	−5.8	−19 33.5	13 54.3	+ 8 1.8	−0.0311	0.5349	−0.1576	+28	−43
56 B. Scorpii	5.0	1.17	5.8	19 33.3	13 54.5	+ 8 2.0	−0.0358	0.5349	0.1576	+28	−43
ω^1 Scorpii	4.3	1.18	6.0	20 25.5	14 32.5	+ 8 38.8	+0.8061	0.5354	0.1566	+70	+ 4
ω^2 Scorpii	4.6	1.19	6.1	20 37.5	14 49.2	+ 8 54.9	+0.9790	0.5356	0.1563	+69	+16
ν Scorpii	3.9	1.21	5.5	19 13.6	17 1.0	+11 2.5	−0.8722	0.5373	0.1527	−18	−90
84 B. Scorpii	6.3	+1.24	−6.0	−20 52.7	18 9.7	−11 51.0	+0.7382	0.5382	−0.1508	+69	0
51 G. Scorpii	6.5	1.25	6.1	21 4.8	19 19.8	−10 43.2	+0.7798	0.5391	0.1489	+69	+ 3
58 G. Scorpii	6.2	1.26	5.6	19 59.9	20 21.1	− 9 44.0	−0.5384	0.5399	0.1472	+ 1	−77
ψ Ophiuchi	4.6	1.29	5.5	19 49.6	22 40.4	− 7 29.3	−1.0592	0.5417	0.1432	−32	−90
ω Ophiuchi	4.5	1.35	5.7	21 16.4	**24** 2 21.3	− 3 55.7	−0.0162	0.5446	0.1368	+27	−42
24 Ophiuchi	5.5	+1.52	−5.7	−23 0.5	13 28.5	+ 6 48.7	+0.4361	0.5533	−0.1155	+50	−17
39 Ophiuchi	5.1	1.67	5.3	24 11.4	22 46.6	− 8 12.9	+0.7064	0.5605	0.0960	+65	− 1
191 B. Ophiuchi	6.3	1.71	5.0	24 9.7	**25** 1 50.4	− 5 15.6	+0.3925	0.5629	0.0892	+45	−19
b Ophiuchi	4.4	1.72	5.0	24 5.6	2 23.2	− 4 43.9	+0.2713	0.5633	0.0880	+37	−26
51 Ophiuchi	4.8	1.75	4.7	23 53.6	4 33.2	− 2 38.7	−0.1256	0.5648	0.0831	+16	−49
63 Ophiuchi	6.1	+1.90	−4.0	−24 52.2	14 27.5	+ 6 53.9	+0.1967	0.5719	−0.0595	+30	−30
4 Sagittarii	4.8	1.91	3.5	23 48.6	16 30.9	+ 8 52.6	−1.0349	0.5732	0.0545	−39	−90
7 Sagittarii	5.5	1.94	3.5	24 17.0	17 46.5	+10 5.4	−0.6040	0.5741	0.0513	−13	−86
9 Sagittarii	6.0	1.94	3.5	24 21.8	18 11.9	+10 29.9	−0.5402	0.5743	0.0502	−10	−79
67 B. Sagittarii	6.4	2.04	3.2	25 38.4	**26** 0 16.5	− 7 39.4	+0.5368	0.5781	0.0347	+50	−11
70 B. Sagittarii	6.4	+2.05	−2.8	−24 57.4	1 26.6	− 6 32.0	−0.2149	0.5787	−0.0317	+ 6	−54
λ Sagittarii	2.9	2.09	2.8	25 28.4	4 3.7	− 4 0.8	+0.2491	0.5802	0.0248	+30	−27
24 Sagittarii	5.7	2.10	1.9	24 6.1	6 29.0	− 1 41.1	−1.2305	0.5815	0.0184	−60	−90
126 B. Sagittarii	5.7	2.17	1.7	25 6.2	10 52.4	+ 2 32.1	−0.2425	0.5837	−0.0065	+ 2	−56
σ Sagittarii	2.3	2.25	1.5	26 24.7	15 1.9	+ 6 31.9	+1.1062	0.5855	+0.0048	+64	+30
162 B. Sagittarii	6.4	+2.24	−0.9	−24 59.9	16 17.0	+ 7 44.1	−0.3451	0.5861	+0.0083	− 3	−63
127 G. Sagittarii	6.4	2.25	0.8	25 4.2	17 6.3	+ 8 31.4	−0.2644	0.5864	0.0105	+ 2	−58
172 B. Sagittarii	5.8	2.25	0.8	24 58.4	17 55.6	+ 9 18.8	−0.3541	0.5867	0.0128	− 3	−64
189 B. Sagittarii	6.1	2.28	−0.3	24 48.0	20 13.5	+11 31.3	−0.4951	0.5876	0.0192	−10	−75
ψ Sagittarii	4.8	2.32	0.0	25 24.9	23 6.3	− 9 42.7	+0.2042	0.5885	0.0272	+28	−30
208 B. Sagittarii	6.1	+2.30	+0.2	−24 20.1	23 7.5	− 9 41.5	−0.9051	0.5885	+0.0273	−33	−90
χ Sagittarii	4.9	2.35	0.7	24 41.1	**27** 2 57.7	− 6 0.4	−0.4178	0.5896	0.0380	− 4	−69
49 Sagittarii	5.5	2.34	0.9	24 8.5	3 3.6	− 5 54.7	−0.9727	0.5896	0.0383	−36	−90
51 Sagittarii	5.8	2.40	1.3	24 55.1	7 11.7	− 1 56.4	+0.0072	0.5906	0.0499	+19	−41
h Sagittarii	4.7	2.40	1.3	25 5.1	7 27.4	− 1 41.4	+0.1904	0.5906	0.0506	+29	−30
53 Sagittarii	6.3	+2.38	+1.8	−23 38.1	8 42.4	− 0 29.4	−1.2257	0.5909	+0.0541	−57	−90

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

AUGUST.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1909.0. Δα	Red'ns from 1909.0. Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle, *H*	*Y*	*x*′	*y*′	N.	S.
		s	″	° ′	d h m	h m				°	°
274 B. Sagittarii	6.1	+2.39	+ 1.8	−23 38.2	**27** 8 49.5	− 0 22.8	−1.2166	0.5909	+0.0544	−56	−90
308 B. Sagittarii	6.3	2.44	2.3	24 10.0	14 23.1	+ 4 57.8	−0.3271	0.5917	0.0700	+ 4	−62
36 B. Capricorni	6.2	2.52	5.0	22 41.5	**28** 4 12.5	− 5 45.9	−0.5853	0.5918	0.1080	− 7	−83
17 Capricorni	5.8	2.55	6.2	21 50.6	10 45.7	+ 0 31.7	−0.6733	0.5910	0.1252	−10	−90
χ Capricorni	5.3	2.58	7.6	21 33.5	19 36.7	+ 9 1.6	+0.2500	0.5891	0.1477	+41	−27
27 Capricorni	6.1	+2.57	+ 7.7	−20 55.2	20 0.4	+ 9 24.4	−0.3291	0.5890	+0.1486	+11	−62
φ Capricorni	5.3	2.58	8.1	21 1.7	22 25.5	+11 43.8	+0.1450	0.5883	0.1545	+36	−33
33 Capricorni	5.3	2.59	8.5	21 14.2	**29** 1 49.2	− 9 0.5	+0.8911	0.5874	0.1625	+69	+10
128 B. Capricorni	6.5	2.57	9.1	19 32.6	4 9.9	− 6 45.3	−0.4100	0.5866	0.1679	+ 9	−67
37 Capricorni	5.7	2.59	9.3	20 29.3	6 6.3	− 4 53.5	+0.8611	0.5860	0.1724	+70	+ 8
ε Capricorni	4.7	+2.58	+ 9.5	−19 52.3	7 0.2	− 4 1.7	+0.4033	0.5857	+0.1744	+53	−19
κ Capricorni	4.8	2.58	9.8	19 16.7	9 14.7	− 1 52.4	+0.2098	0.5848	0.1793	+42	−30
143 B. Capricorni	6.1	2.59	9.8	20 2.0	9 28.2	− 1 39.4	+1.0008	0.5848	0.1797	+70	+17
152 B. Capricorni	6.5	2.54	10.4	17 16.0	12 19.0	+ 1 4.7	−1.2269	0.5837	0.1858	−43	−90
154 B. Capricorni	6.1	2.58	10.3	19 2.7	12 53.7	+ 1 38.1	+0.6450	0.5835	0.1869	+69	− 6
161 B. Capricorni	6.4	+2.58	+10.9	−18 20.3	17 9.6	+ 5 44.2	+0.7594	0.5818	+0.1956	+72	+ 1
29 Aquarii (*mean*)	6.5	2.56	11.1	17 24.0	17 16.3	+ 5 50.6	−0.1475	0.5818	0.1959	+25	−50
56 Aquarii	6.1	2.52	12.5	15 2.9	**30** 4 42.5	− 7 9.2	−0.1099	0.5770	0.2167	+29	−47
69 Aquarii	5.6	2.50	13.3	14 32.0	11 57.4	− 0 10.6	+0.9943	0.5739	0.2280	+75	+15
τ Aquarii	4.4	2.49	13.4	14 4.2	12 44.8	+ 0 35.1	+0.7185	0.5735	0.2292	+76	− 2
74 Aquarii	5.8	+2.46	+13.6	−12 5.8	14 23.0	+ 2 9.7	−0.8465	0.5728	+0.2315	− 9	−90
257 B. Aquarii	6.3	2.47	13.9	13 33.3	16 56.9	+ 4 37.9	+1.1864	0.5717	0.2350	+76	+30
290 B. Aquarii	6.3	2.43	14.4	11 10.8	23 20.0	+10 46.8	+0.3759	0.5691	0.2429	+59	−21
ψ^1 Aquarii	4.5	2.42	14.4	9 34.8	23 50.5	+11 16.2	−1.0730	0.5689	0.2434	−22	−90
ψ^2 Aquarii	4.6	2.41	14.4	9 40.5	**31** 0 42.7	−11 53.5	−0.7665	0.5686	0.2443	− 2	−90
ψ^3 Aquarii	5.2	+2.41	+14.5	−10 6.3	1 9.6	−11 27.6	−0.2352	0.5684	+0.2448	+26	−54
336 B. Aquarii	6.3	2.39	14.8	9 45.8	5 27.5	− 7 19.0	+0.4907	0.5667	0.2492	+68	−15
351 B. Aquarii	6.5	2.36	14.9	7 57.8	8 15.4	− 4 37.2	−0.5746	0.5656	0.2517	+ 9	−78
376 B. Aquarii	6.3	2.33	15.2	6 52.9	13 52.1	+ 0 47.4	−0.2123	0.5637	0.2562	+29	−53
30 Piscium	4.7	2.30	15.5	6 30.9	19 41.4	+ 6 24.2	+0.9305	0.5618	0.2597	+83	+ 9
33 Piscium	4.7	+2.29	+15.6	− 6 12.7	21 9.8	+ 7 49.5	+1.0161	0.5613	+0.2604	+84	+15
24 B. Ceti	6.0	2.28	15.6	5 45.0	23 20.1	+ 9 55.1	+1.1283	0.5607	0.2614	+84	+23
SEPTEMBER.											
54 B. Ceti	6.3	+2.23	+15.4	− 2 43.1	**1** 5 32.8	− 8 5.3	−0.2193	0.5591	+0.2635	+29	−54
14 Ceti	5.4	2.20	15.3	1 0.1	10 23.9	− 3 24.4	−0.6272	0.5580	0.2643	+ 8	−82
MARS	. .	. . .	. . .	− 2 40.3	10 30.8	− 3 17.8	+1.0522	0.5665	0.2681	+87	+17
26 Ceti	6.0	2.12	15.2	+ 0 53.0	22 53.4	+ 8 39.0	+0.8183	0.5560	0.2634	+90	+ 2
33 Ceti	6.1	2.09	15.1	1 57.9	**2** 1 52.8	+11 32.0	+0.5373	0.5556	0.2626	+75	−13
f Piscium	5.1	+2.06	+14.8	+ 3 8.4	5 5.3	− 9 22.2	+0.2190	0.5555	+0.2614	+54	−29
117 G. Piscium	6.5	2.04	14.9	3 4.1	9 7.4	− 5 28.5	+1.3419	0.5552	0.2595	+90	+45
μ Piscium	5.0	2.04	14.3	5 40.8	10 33.4	− 4 5.5	−0.8712	0.5552	0.2587	− 6	−84
SATURN	. .	. . .	. . .	6 15.5	11 24.9	− 3 15.8	−1.2236	0.5572	0.2592	−31	−84
ν Piscium	4.6	1.99	14.4	5 1.9	15 33.9	+ 0 44.6	+1.0594	0.5552	0.2557	+90	+19
64 Ceti	5.8	+1.89	+13.3	+ 8 8.9	**3** 4 47.9	−10 29.1	+1.2791	0.5560	+0.2443	+90	+40
ξ^1 Ceti	4.5	1.88	13.3	8 25.4	5 31.2	− 9 47.3	+1.1801	0.5562	0.2435	+90	+30
ξ Arietis	5.5	1.85	12.7	10 12.1	10 42.8	− 4 46.6	+0.6563	0.5568	0.2378	+86	− 4
25 Arietis	6.5	1.82	12.6	9 47.9	11 51.9	− 3 40.0	+1.3338	0.5569	0.2364	+90	+49
31 Arietis	5.7	1.82	11.9	12 3.4	15 52.7	+ 0 12.4	+0.0125	0.5576	0.2315	+42	−37
38 Arietis	5.2	+1.78	+11.8	+12 4.0	19 32.2	+ 3 44.2	+0.8414	0.5582	+0.2267	+90	+ 8
σ Arietis	5.5	1.77	10.9	14 42.6	22 22.1	+ 6 28.1	−1.1799	0.5588	0.2227	−29	−75
145 B. Arietis	6.5	1.72	10.3	15 30.3	**4** 4 6.4	−11 59.8	−0.7303	0.5599	0.2141	+ 2	−74
26 B. Tauri	6.4	1.61	8.9	17 32.2	16 49.1	+ 0 15.6	−0.2012	0.5628	0.1927	+30	−44
14 Tauri	6.2	1.59	8.2	19 22.8	20 56.0	+ 4 13.6	−1.3003	0.5637	0.1850	−48	−71
43 Tauri	5.5	+1.48	+ 7.6	+19 22.3	**5** 7 45.4	− 9 20.6	+0.5951	0.5663	+0.1635	+83	+ 1

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

SEPTEMBER.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1909.0.		Apparent Declination.	Washington Mean Time.	Hour Angle, *H*	*Y*	*x'*	*y'*	N.	S.
		Δα	Δδ								
		s	"	° '	d h m	h m				°	°
ω Tauri	4.8	+1.44	+7.0	+20 21.4	5 11 10.8	− 6 2.8	+0.1320	0.5671	+0.1563	+49	−22
51 Tauri	5.6	1.45	6.7	21 21.6	11 38.1	− 5 36.4	−0.8262	0.5672	0.1553	− 6	−69
53 Tauri	5.3	1.44	6.8	20 55.5	12 5.3	− 5 10.2	−0.3096	0.5672	0.1544	+24	−46
56 Tauri	5.2	1.44	6.6	21 33.4	12 9.2	− 5 6.4	−0.9484	0.5674	0.1543	−14	−68
224 B. Tauri	6.1	1.42	6.9	20 36.5	13 20.4	− 3 57.8	+0.2064	0.5676	0.1517	+54	−18
227 B. Tauri	5.9	+1.42	+6.8	+20 46.3	13 49.6	− 3 29.7	+0.1118	0.5676	+0.1506	+48	−22
κ Tauri	4.1	1.42	6.3	22 5.3	14 34.5	− 2 46.5	−1.1296	0.5678	0.1490	−29	−68
67 Tauri	5.4	1.42	6.3	21 59.7	14 35.8	− 2 45.2	−1.0298	0.5678	0.1489	−20	−68
247 B. Tauri	5.8	1.41	6.4	21 25.1	15 42.1	− 1 41.3	−0.2751	0.5680	0.1465	+26	−43
129 H'. Tauri	5.8	1.35	6.5	20 30.3	20 2.4	+ 2 29.4	+1.2839	0.5690	0.1369	+90	+57
τ Tauri	4.5	+1.35	+5.6	+22 47.1	21 40.6	+ 4 4.0	−0.8496	0.5693	+0.1331	− 7	−67
99 Tauri	6.0	1.29	4.8	23 48.5	6 4 11.2	+10 20.2	−1.0953	0.5705	0.1180	−27	−66
103 Tauri	5.5	1.24	4.4	24 8.8	8 29.4	− 9 31.2	−0.9636	0.5710	0.1076	−16	−66
118 Tauri	5.4	1.15	3.6	25 4.7	17 18.3	− 1 2.0	−1.0848	0.5718	0.0861	−27	−65
121 Tauri	5.1	1.12	3.9	23 58.8	19 53.9	+ 1 27.9	+0.2770	0.5719	0.0796	+58	− 7
132 Tauri	5.0	+1.05	+3.3	+24 32.3	7 1 32.6	+ 6 54.0	+0.1025	0.5720	+0.0654	+47	−15
412 B. Tauri	5.8	1.01	3.3	24 14.3	4 51.0	+10 4.9	+0.6216	0.5719	0.0570	+88	+13
139 Tauri	4.7	1.02	2.7	25 56.6	5 15.7	+10 28.7	−1.1492	0.5719	0.0560	−34	−64
5 Geminorum	5.9	0.95	2.8	24 26.5	10 56.5	− 8 3.2	+0.7092	0.5715	0.0415	+90	+20
8 Geminorum	6.1	0.92	2.9	24 0.0	12 56.8	− 6 7.4	+1.2538	0.5714	0.0364	+90	+62
52 B. Geminorum	6.5	+0.83	+2.2	+24 40.1	21 47.8	+ 2 24.0	+0.7747	0.5699	+0.0138	+90	+26
ε Geminorum	3.2	0.80	1.9	25 13.3	8 0 30.8	+ 5 1.1	+0.2144	0.5694	+0.0069	+54	− 4
37 Geminorum	5.7	0.75	1.6	25 29.4	5 19.0	+ 9 38.7	−0.0668	0.5683	−0.0053	+37	−18
39 Geminorum	6.2	0.74	1.4	26 12.1	6 47.1	+11 3.5	−0.8349	0.5678	0.0090	− 8	−64
40 Geminorum	6.3	0.74	1.4	26 2.3	7 4.0	+11 19.6	−0.6639	0.5678	0.0097	+ 3	−58
ω Geminorum	5.2	+0.72	+1.8	+24 20.8	8 20.9	−11 26.1	+1.1255	0.5674	−0.0129	+90	+50
48 Geminorum	5.8	0.67	1.6	24 16.9	12 37.1	− 7 19.2	+1.1187	0.5661	0.0235	+90	+48
52 Geminorum	6.1	0.67	1.3	25 2.6	13 34.1	− 6 24.3	+0.2812	0.5657	0.0258	+59	− 2
A Geminorum	5.1	0.63	1.2	25 13.6	17 19.8	− 2 46.8	−0.0282	0.5644	0.0351	+40	−19
176 B. Geminorum	6.3	0.57	1.1	24 33.9	23 42.8	+ 3 22.5	+0.4085	0.5619	0.0504	+68	+ 2
181 B. Geminorum	6.0	+0.56	+1.1	+24 25.8	9 0 7.9	+ 3 46.6	+0.5326	0.5617	−0.0514	+78	+ 9
κ Geminorum	3.6	0.54	1.0	24 37.0	2 24.7	+ 5 58.5	+0.2081	0.5608	0.0568	+54	− 9
5 B. Cancri	6.4	0.47	0.9	23 50.0	9 41.3	−11 0.3	+0.5777	0.5575	0.0735	+83	+ 9
4 Cancri	6.2	0.47	0.6	25 20.4	9 58.8	−10 43.5	−1.0684	0.5573	0.0742	−26	−65
35 B. Cancri	6.4	0.42	0.9	23 24.7	15 19.3	− 5 34.1	+0.5843	0.5546	0.0861	+83	+ 8
λ Cancri	5.9	+0.40	+0.6	+24 18.6	18 22.0	− 2 37.7	−0.6582	0.5530	−0.0926	+ 4	−63
28 Cancri	6.1	0.37	0.4	24 26.8	22 0.3	+ 0 53.1	−1.1598	0.5511	0.1003	−34	−65
υ¹ Cancri	5.7	0.36	0.4	24 23.3	23 19.2	+ 2 9.3	−1.2304	0.5503	0.1031	−43	−66
γ Cancri	4.9	0.30	0.9	21 47.8	10 4 43.8	+ 7 23.0	+0.9940	0.5473	0.1141	+90	+30
ξ Cancri	5.2	0.23	0.5	22 24.9	16 50.3	− 4 54.6	−1.2014	0.5403	0.1371	−37	−68
79 Cancri	6.1	+0.22	+0.5	+22 22.0	17 18.3	− 4 27.6	−1.2136	0.5399	−0.1378	−38	−68
90 H'. Cancri	6.1	0.21	0.6	21 39.5	18 51.8	− 2 57.1	−0.6589	0.5391	0.1406	+ 5	−66
57 B. Leonis	6.5	0.13	0.8	19 16.9	11 9 46.0	+11 28.5	−0.3442	0.5302	0.1650	+22	−50
107 B. Leonis	6.3	0.07	1.1	16 12.1	20 18.5	− 2 18.6	+1.2196	0.5240	0.1800	+90	+41
η Leonis	3.6	+0.07	+0.9	+17 12.4	21 7.4	− 1 31.2	−0.0332	0.5235	0.1810	+40	−35
				NEW	*MOON.*						
65 Virginis	6.0	+0.06	−1.1	− 4 26.9	16 7 45.6	+ 6 8.3	+0.3903	0.4951	−0.2333	+64	−21
66 Virginis	5.7	0.07	1.2	4 41.3	8 26.5	+ 6 48.1	+0.4983	0.4952	0.2331	+71	−16
72 Virginis	6.1	0.07	1.4	6 0.1	11 43.2	+ 9 59.4	+1.1942	0.4957	0.2321	+84	+28
l Virginis	4.8	+0.08	−1.4	− 5 47.2	12 35.3	+10 50.2	+0.7543	0.4958	−0.2318	+80	− 2
80 Virginis	5.6	0.10	1.2	4 56.0	14 34.3	−11 14.1	−0.6533	0.4962	0.2311	+ 6	−86
88 Virginis	6.5	0.13	1.6	6 23.0	21 39.6	− 4 20.3	−0.6689	0.4975	0.2282	+ 5	−87
598 B. Virginis	6.1	0.14	2.0	7 36.7	17 1 20.5	− 0 45.5	−0.1419	0.4984	0.2264	+32	−49
623 B. Virginis	6.5	0.17	2.2	8 49.3	6 29.0	+ 4 14.6	+0.0440	0.4998	0.2236	+41	−39
95 Virginis	5.4	+0.18	−2.2	− 8 52.8	7 46.6	+ 5 30.0	−0.1795	0.5002	−0.2227	+30	−51

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

SEPTEMBER.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1909.0. $\Delta\alpha$	Red'ns from 1909.0. $\Delta\delta$	Apparent Declination.	Washington Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
		s	"	° '	d h m	h m				°	°
96 Virginis	6.5	+0.19	-2.5	- 9 54.3	17 9 0.9	+ 6 42.2	+0.6819	0.5006	-0.2220	+80	- 5
κ Virginis	4.2	0.20	2.4	9 51.1	11 8.0	+ 8 45.8	+0.1537	0.5013	0 2206	+47	-33
2 Libræ	6.3	0.24	2.9	11 18.0	16 49.7	- 9 42.0	+0.5137	0.5032	0.2166	+68	-14
4 G. Libræ	6.5	0.24	2.9	11 15.5	17 30.6	- 9 2.3	+0.3197	0.5035	0.2161	+56	-24
6 B. Libræ	6.2	0.25	2.8	11 55.2	18 0 9.1	- 2 35.2	-0.3659	0.5062	0.2109	+18	-63
22 B. Libræ	6.4	+0.34	-3.3	-12 27.5	5 53.2	+ 2 59.1	-0.9642	0.5087	-0.2057	-16	-90
μ Libræ	5.4	0.34	3.6	13 46.3	6 36.9	+ 3 41.6	+0.3373	0.5090	0.2050	+55	-23
ν Libræ	5.3	0.42	4.2	15 54.3	15 37.4	-11 33.7	+0.8849	0.5135	0.1959	+74	+ 8
22 Libræ	6.5	0.42	4.2	16 8.0	15 43.2	-11 28.0	+1.1171	0.5136	0.1958	+74	+24
ο Libræ	6.2	0.49	3.9	15 13.3	23 1.2	- 4 23.0	-1.2861	0.5175	0.1874	-47	-90
32 Libræ	5.9	+0.53	-4.3	-16 24.1	19 2 40.2	- 0 50.7	-0.6645	0.5196	-0.1829	- 1	-89
34 Libræ	6.0	0.54	4.2	16 17.9	3 53.3	+ 0 20.2	-0.9986	0.5202	0.1813	-22	-90
ζ Libræ	5.6	0.55	4.3	16 32.8	5 1.0	+ 1 25.8	-0.9304	0.5210	0.1799	-18	-90
41 Libræ	5.3	0 59	5.0	19 0.2	7 58.2	+ 4 17.6	+1.2414	0.5228	0.1760	+71	+38
λ Libræ	4.9	0.66	5.2	19 53.8	15 5.3	+11 11.5	+0.9996	0.5272	0.1660	+70	+17
47 Libræ	5.8	+0.67	-4.9	-19 7.0	15 55.2	+11 59.8	+0.0074	0.5277	-0.1647	+31	-41
β^1 Scorpii	2.9	0.73	5.0	19 33.5	20 58.8	- 7 6.2	-0.3230	0.5310	0.1570	+14	-61
56 B. Scorpii	5.0	0.73	5.0	19 33.3	20 59.0	- 7 6.0	-0.3277	0.5310	0.1570	+13	-61
ω^1 Scorpii	4.3	0.74	5.2	20 25.5	21 37.6	- 6 28.5	+0.5217	0.5314	0.1560	+60	-13
ω^2 Scorpii	4.6	0.75	5.3	20 37.5	21 54.6	- 6 12.1	+0.6960	0.5316	0.1555	+69	- 3
ν Scorpii	3.9	+0.77	-4.8	-19 13.6	20 0 8.4	- 4 2.5	-1.1724	0.5331	-0.1519	-40	-90
84 B. Scorpii	6.3	0.79	5.3	·20 52.7	1 18.1	- 2 55.0	+0.4532	0.5338	0.1501	+55	-17
51 G. Scorpii	6.5	0.80	5.3	21 4.8	2 29.3	- 1 46.1	+0.4952	0.5347	0.1480	+57	-14
58 G. Scorpii	6.2	0.81	4.9	19 59.9	3 31.7	- 0 45.7	-0.8358	0.5353	0.1463	-16	-90
ω Ophiuchi	4.5	0.90	5.1	21 16.4	9 38.0	+ 5 8.6	-0.3082	0.5394	0.1357	+12	-60
24 Ophiuchi	5.5	+1.05	-5.3	-23 0.5	20 58.2	- 7 53.9	+0.1517	0.5471	-0.1143	+33	-33
39 Ophiuchi	5.1	1.19	5.2	24 11.4	21 6 28.4	+ 1 16.7	+0.4293	0.5535	0.0947	+47	-17
θ Ophiuchi	3.3	1.22	5.4	24 54.7	8 13.7	+ 2 58.4	+1.0404	0.5546	0.0909	+65	+22
191 B. Ophiuchi	6.3	1.24	5.0	24 9.7	9 36.4	+ 4 18.1	+0.1133	0.5556	0.0879	+29	-35
b Ophiuchi	4.4	1.25	5.1	24 5.6	10 10.0	+ 4 50.6	-0.0091	0.5559	0.0867	+22	-42
51 Ophiuchi	4.8	+1.28	-4.8	-23 53.6	12 23.1	+ 6 58.9	-0.4096	0.5575	-0.0817	+ 1	-68
63 Ophiuchi	6.1	1.44	4.4	24 52.2	22 32.2	- 7 13.7	-0.0764	0.5635	0.0582	+16	-46
7 Sagittarii	5.5	1.48	3.9	24 17.0	22 1 56.5	- 3 56.8	-0.8849	0.5654	0.0500	-29	-90
9 Sagittarii	6.0	1.49	3.9	24 21.9	2 22.5	- 3 31.7	-0.8202	0.5657	0.0490	-25	-90
67 B. Sagittarii	6.4	1.59	3.9	25 38.4	8 36.9	+ 2 28.9	+0.2768	0.5692	0.0335	+33	-26
70 B. Sagittarii	6.4	+1.60	-3.5	-24 57.5	9 48.9	+ 3 38.3	-0.4840	0.5698	0.0305	- 8	-75
λ Sagittarii	2.9	1.65	3.6	25 28.4	12 30.3	+ 6 13.7	-0.0111	0.5711	0.0237	+16	-42
86 B. Sagittarii	6.5	1.67	3.8	26 38.5	12 53.5	+ 6 36.0	+1.2123	0.5714	0.0227	+63	+43
126 B. Sagittarii	5.7	1.75	2.6	25 6.2	19 30.6	-11 1.8	-0.5023	0.5742	-0.0055	-12	-76
σ Sagittarii	2.3	1.83	2.6	26 24.7	23 47.2	- 6 54.9	+0.8698	0.5759	+0.0057	+64	+10
162 B. Sagittarii	6.4	+1.82	-2.0	-25 0.0	23 1 4.4	- 5 40.6	-0.5999	0.5763	+0.0091	-16	-86
127 G. Sagittarii	6.4	1.84	1.8	25 4.2	1 55.2	4 51.8	-0.5171	0.5766	0.0114	-12	-77
172 B. Sagittarii	5.8	1.85	1.9	24 58.4	2 45.9	- 4 2.9	-0.6071	0.5769	0.0136	-16	-87
189 B. Sagittarii	6.1	1.88	1.4	24 48.0	5 7.7	- 1 46.6	-0.7470	0.5777	0.0200	-24	-90
ψ Sagittarii	4 8	1.94	1.3	25 24.9	8 5.6	+ 1 4.5	-0.0345	0.5786	0.0279	+15	-44
208 B. Sagittarii	6.1	+1.92	-1.0	-24 20.1	8 6.8	+ 1 5.7	-1.1590	0.5788	+0.0280	-52	-90
χ Sagittarii	4.9	1.98	0.6	24 41.2	12 3.7	+ 4 53.5	-0.6600	0.5797	0.0386	-17	-90
49 Sagittarii	5.5	1.97	0.4	24 8.5	12 9.7	+ 4 59.3	-1.2222	0.5797	0.0389	-57	-90
51 Sagittarii	5.8	2.04	0.1	24 55.1	16 25.0	+ 9 4.8	-0.2231	0.5806	0.0504	+ 7	-55
h Sagittarii	4.7	2.05	-0.2	25 5.1	16 41.2	+ 9 20.3	-0.0371	0.5808	0.0511	+17	-44
308 B. Sagittarii	6.3	+2.11	+0.8	-24 10.1	23 48.7	7 48.7	-0.5508	0.5819	+0.0704	- 8	-80
36 B. Capricorni	6.2	2.26	3.4	22 41.6	24 14 1.1	+ 5 50.8	-0.7883	0.5824	0.1081	-18	-90
56 B. Capricorni	6.3	2.36	3.9	24 6 4	18 16.8	+ 9 56.6	+1.1360	0.5822	0.1191	+66	+31
17 Capricorni	5.8	2.32	4.6	21 50.6	20 44.4	-11 41.5	-0.8646	0.5820	0.1253	-21	-90
χ Capricorni	5.3	2.41	5.9	21 33.5	25 5 48.3	- 2 58.6	+0.0866	0.5808	0.1477	+32	-36
27 Capricorni	6.1	+2.40	+6.1	-20 55.2	6 12.5	- 2 35.3	-0.4974	0.5808	+0.1487	+ 2	-74

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

SEPTEMBER.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1909.0. Δα	Red'ns from 1909.0. Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle, H	Y	x′	y′	N.	S.
		s	"	° ′	d h m	h m				°	°
φ Capricorni	5.3	+2.42	+ 6.5	−21 1.7	**25** 8 40.9	− 0 12.7	−0.0136	0.5803	+0.1545	+28	−42
33 Capricorni	5.3	2.45	6.8	21 14.2	12 9.1	+ 3 7.6	+0.7466	0.5797	0.1627	+67	0
35 Capricorni	6.0	2.47	6.9	21 35.3	13 24.5	+ 4 20.1	+1.3058	0.5794	0.1655	+68	+53
128 B. Capricorni	6.5	2.45	7.6	19 32.6	14 32.8	+ 5 25.8	−0.5608	0.5792	0.1681	+ 1	−79
37 Capricorni	5.7	2.48	7.6	20 29.3	16 31.6	+ 7 20.0	+0.7252	0.5786	0.1725	+69	− 1
ε Capricorni	4.7	+2.47	+ 7.9	−19 52.3	17 26.5	+ 8 12.9	+0.2658	0.5785	+0.1746	+45	−27
κ Capricorni	4.8	2.49	8.4	19 16.7	19 43.6	+10 24.7	+0.0759	0.5780	0.1795	+35	−37
143 B. Capricorni	6.1	2.50	8.2	20 2.1	19 57.3	+10 37.9	+0.8736	0.5778	0.1800	+70	+ 8
154 B. Capricorni	6.1	2.51	8.8	19 2.7	23 26.5	−10 0.8	+0.5226	0.5771	0.1874	+61	−13
161 B. Capricorni	6.4	2.52	9.6	18 20.3	**26** 3 46.8	− 5 50.4	+0 6477	0.5758	0.1962	+70	− 6
29 Aquarii (*mean*)	6.5	+2.51	+ 9.8	−17 24.0	3 53.6	− 5 43.9	−0.2646	0.5758	+0.1963	+19	−57
56 Aquarii	6.1	2.54	11.6	15 2.9	15 29.2	+ 5 25.6	−0.1972	0.5725	0.2177	+25	−53
69 Aquarii	5.6	2.56	12.6	14 32.0	22 48.3	−11 31.5	+0.9296	0.5706	0.2294	+75	+10
τ Aquarii	4.4	2.56	12.7	14 4.2	23 36.0	−10 45.5	+0.6551	0.5703	0.2307	+75	− 6
74 Aquarii	5.8	2.54	13.2	12 5.8	**27** 1 14.9	− 9 10.2	−0.9088	0.5699	0.2331	−11	−90
257 B. Aquarii	6.3	+2.57	+13.2	−13 33.3	3 49.8	− 6 41.0	+1.1345	0.5692	+0.2368	+76	+25
290 B. Aquarii	6.3	2.56	14.2	11 10.8	10 14.6	− 0 30.3	+0.3406	0.5674	0.2450	+57	−23
ψ^1 Aquarii	4.5	2.56	14.4	9 34.8	10 45.1	− 0 0.9	−1.1067	0.5672	0.2456	−24	−90
ψ^2 Aquarii	4.6	2.55	14.4	9 40.5	11 37.5	+ 0 49.6	−0.7977	0.5671	0.2466	− 4	−90
ψ^3 Aquarii	5.2	2.55	14.4	10 6.3	12 4.4	+ 1 15.5	−0.2653	0.5670	0.2471	+25	−56
336 B. Aquarii	6.3	+2.56	+14.8	− 9 45.8	16 22.5	+ 5 24.3	+0.4723	0.5659	+0.2518	+67	−17
351 B. Aquarii	6.5	2.55	15.2	7 57.8	19 10.3	+ 8 5.9	−0.5832	0.5653	0.2545	+ 9	−79
376 B. Aquarii	6.3	2.55	15.6	6 52.9	**28** 0 46.0	−10 30.5	−0.2050	0.5643	0.2593	+29	−53
30 Piscium	4.7	2.56	16.0	6 30.9	6 33.3	− 4 55.6	+0.9499	0.5632	0.2633	+83	+10
33 Piscium	4.7	2.55	16.2	6 12.7	8 1.1	− 3 31.0	+1.0390	0.5630	0.2642	+84	+16
MARS	. .	. . .	. . .	− 4 29.2	9 53.8	− 1 42.4	−0.1510	0.5776	+0.2687	+33	−50
24 B. Ceti	6.0	+2.55	+16.3	5 45.0	10 10.3	− 1 26.4	+1.1566	0.5627	0.2654	+84	+25
54 B. Ceti	6.3	2.53	16.6	2 43.1	16 19.1	+ 4 29.2	−0.1658	0.5620	0.2678	+32	−51
14 Ceti	5.4	2.53	16.8	− 1 0.0	21 6.5	+ 9 6.4	−0.5567	0.5616	0.2689	+12	−76
26 Ceti	6.0	2.52	17.0	+ 0 53.0	**29** 9 23.5	− 3 2.9	+0.9105	0.5614	0.2687	+90	+ 8
33 Ceti	6.1	+2.50	+17.0	+ 1 58.0	12 19.4	− 0 13.2	+0.6400	0.5614	+0.2680	+84	− 8
f Piscium	5.1	2.49	16.9	3 8.4	15 27.8	+ 2 48.5	+0.3334	0.5616	0.2669	+61	−24
SATURN	. .	. . . .	. . .	5 33.0	18 53.2	+ 6 6.6	−1.1126	0.5649	0.2668	−21	−84
μ Piscium	5.0	2.50	16.7	5 40.8	20 48.4	+ 7 57.6	−0.7305	0.5620	0.2644	+ 3	−83
ν Piscium	4.6	2.48	16.7	5 1.9	**30** 1 41.5	−11 19.7	+1.1888	0.5624	0.2614	+90	+28
ξ^1 Ceti	4.5	+2.44	+15.9	+ 8 25.5	15 15.5	+ 1 45.0	+1.3374	0.5648	+0.2496	+90	+47
ξ Arietis	5.5	2.44	15.4	10 12.2	20 17.7	+ 6 36.2	+0.8310	0.5657	0.2437	+90	+ 6

OCTOBER.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1909.0. Δα	Red'ns from 1909.0. Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle, H	Y	x′	y′	N.	S.
31 Arietis	5.7	+2.44	+14.8	+12 3.5	**1** 1 17.8	+11 25.5	+0.2065	0.5669	+0.2373	+53	−27
38 Arietis	5.2	2.42	14.6	12 4.0	4 50.2	− 9 9.8	+1.0290	0.5678	0.2324	+90	+20
σ Arietis	5.5	2.42	13.9	14 42.7	7 34.5	− 6 31.6	−0.9561	0.5683	0.2283	−12	−75
145 B. Arietis	6.5	2.39	13.2	15 30.4	13 7.3	− 1 11.0	−0.5041	0.5698	0.2196	+15	−64
26 B. Tauri	6.4	2.35	11.6	17 32.3	**2** 1 23.8	+10 38.1	+0.0341	0.5729	0.1975	+43	−31
13 Tauri	5.6	+2.34	+11.1	+19 24.7	4 45.9	−10 7.3	−1.1887	0.5737	+0.1908	−32	−72
14 Tauri	6.2	2.34	11.0	19 22.9	5 22.2	− 9 32.4	−1.0427	0.5740	0.1896	−19	−71
43 Tauri	5.5	2.27	10.0	19 22.3	15 49.1	+ 0 30.9	+0.8332	0.5762	0.1674	+90	+15
ω Tauri	4.8	2.25	9.4	20 21.5	19 7.5	+ 3 41.7	+0.3802	0.5769	0.1599	+65	− 9
51 Tauri	5.6	2.27	9.0	21 21.6	19 33.9	+ 4 7.2	−0.5626	0.5771	0.1589	+11	−61
53 Tauri	5.3	+2.25	+ 9.1	+20 55.5	20 0.2	+ 4 32.5	−0.0539	0.5772	+0.1579	+38	−32
56 Tauri	5.2	2.26	8.9	21 33.4	20 3.9	+ 4 36.0	−0.6825	0.5772	0.1578	+ 4	−68
224 B. Tauri	6.1	2.24	9.1	20 36.6	21 12.7	+ 5 42.2	+0.4550	0.5773	0.1552	+71	− 5
227 B. Tauri	5.9	2.24	9.0	20 46.4	21 40.9	+ 6 9.4	+0.3623	0.5775	0.1540	+64	−10
κ Tauri	4.1	2.25	8.5	22 5.3	22 24.3	+ 6 51.1	−0.8592	0.5776	0.1524	− 8	−68
67 Tauri	5.4	+2.25	+ 8.5	+21 59.7	22 25.6	+ 6 52.4	−0.7610	0.5776	+0.1523	− 1	−68

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

OCTOBER.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1909.0.		Apparent Declination.	Washington Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
		Δα	Δδ								
		s	"	° ′	d h m	h m				°	°
247 B. Tauri	5.8	+2.24	+8.5	+21 25.2	2 23 29.6	+ 7 54.0	-0.0173	0.5777	+0.1497	+41	-29
284 B. Tauri	6.0	2.23	7.6	23 9.5	3 2 55.1	+11 11.6	-1.2832	0.5784	0.1416	-50	-67
τ Tauri	4.5	2.20	7.6	22 47.1	5 16.2	-10 32.7	-0.5795	0.5786	0.1359	+ 9	-60
300 B. Tauri	6.2	2.19	7.2	23 27.8	6 40.0	- 9 12.1	-1.0837	0.5788	0.1325	-25	-67
99 Tauri	6.0	2.15	6.5	23 48.5	11 34.3	- 4 29.1	-0.8189	0.5792	0.1203	- 6	-66
103 Tauri	5.5	+2.12	+6.0	+24 8.8	15 44.3	- 0 28.7	-0.6878	0.5795	+0.1096	+ 3	-65
118 Tauri	5.4	2.04	4.7	25 4.7	4 0 17.5	+ 7 44.8	-0.8058	0.5795	0.0875	- 5	-65
121 Tauri	5.1	2.00	4.8	23 58.9	2 48.7	+10 10.3	+0.5381	0.5794	0.0808	+79	+ 6
125 Tauri	5.1	2.01	3.9	25 50.9	4 30.9	+11 48.5	-1.2566	0.5794	0.0763	-50	-64
132 Tauri	5.0	1.94	3.9	24 32.3	8 18.0	- 8 33.1	+0.3667	0.5790	0.0662	+65	- 1
412 B. Tauri	5.8	+1.90	+3.7	+24 14.3	11 31.2	- 5 27.3	+0.8794	0.5786	+0.0576	+90	+28
139 Tauri	4.7	1.92	3.0	25 56.5	11 55.3	- 5 4.1	-0.8694	0.5785	0.0566	-10	-64
5 Geminorum	5.9	1.84	2.9	24 26.5	17 27.6	+ 0 15.5	+0.9664	0.5776	0.0417	+90	+36
52 B. Geminorum	6.5	1.71	1.8	24 40.0	5 4 4.4	+10 28.1	+1.0301	0.5748	0.0135	+90	+43
ε Geminorum	3.2	1.69	1.3	25 13.3	6 44.1	-10 58.3	+0.4750	0.5738	+0.0064	+74	+10
37 Geminorum	5.7	+1.63	+0.7	+25 29.4	11 26.8	- 6 26.1	+0.1950	0.5722	-0.0059	+53	- 5
39 Geminorum	6.2	1.62	0.4	26 12.1	12 53.3	- 5 2.9	-0.5665	0.5716	0.0096	+ 9	-50
40 Geminorum	6.3	1.62	+0.3	26 2.3	13 9.9	- 4 46.9	-0.3973	0.5715	0.0103	+19	-38
52 Geminorum	6.1	1.53	0.0	25 2.6	19 33.5	+ 1 22.4	+0.5365	0.5687	0.0267	+79	+11
A Geminorum	5.1	1.48	-0.3	25 13.6	23 15.9	+ 4 56.6	+0.2278	0.5670	0.0360	+56	- 5
176 B. Geminorum	6.3	+1.40	-0.7	+24 33.9	6 5 33.8	+11 0.8	+0.6577	0.5637	-0.0515	+90	+16
181 B. Geminorum	6.0	1.39	0.7	24 25.7	5 58.6	+11 24.8	+0.7807	0.5635	0.0525	+90	+23
κ Geminorum	3.6	1.37	0.9	24 37.0	8 13.8	-10 24.9	+0.4568	0.5623	0.0579	+72	+ 4
ω^1 Cancri	6.0	1.29	1.8	25 38.5	15 21.9	- 3 32.1	-1.1144	0.5582	0.0746	-30	-64
5 B. Cancri	6.4	1.27	1.2	23 50.0	15 26.0	- 3 28.2	+0.8193	0.5582	0.0747	+90	+23
4 Cancri	6.2	+1.28	-1.7	+25 20.4	15 43.3	- 3 11.5	-0.8175	0.5581	-0.0754	- 6	-65
35 B. Cancri	6.4	1.20	1.5	23 24.7	21 1.2	+ 1 55.3	+0.8217	0.5549	0.0873	+90	+22
λ Cancri	5.9	1.17	2.0	24 18.5	7 0 2.7	+ 4 50.4	-0.4175	0.5530	0.0939	+18	-47
28 Cancri	6.1	1.13	2.4	24 26.8	3 39.6	+ 8 19.8	-0.9205	0.5507	0.1016	-13	-66
υ^1 Cancri	5.7	1.11	2.4	24 23.3	4 58.1	+ 9 35.6	-0.9922	0.5498	0.1043	-18	-66
υ^2 Cancri	6.4	+1.10	-2.5	+24 23.6	5 38.5	+10 14.6	-1.0701	0.5494	-0.1057	-24	-66
γ Cancri	4.9	1.03	1.9	21 47.7	10 21.4	- 9 12.1	+1.2177	0.5464	0.1153	+90	+49
ξ Cancri	5.2	0.91	2.8	22 24.8	22 26.4	+ 2 28.8	-0.9851	0.5386	0.1381	-17	-68
79 Cancri	6.1	0.90	2.8	22 21.9	22 54.4	+ 2 55.9	-0.9979	0.5381	0.1390	-17	-68
90 H'. Cancri	6.1	0.88	2.7	21 39.5	8 0 27.8	+ 4 26.2	-0.4466	0.5371	0.1417	+17	-53
57 B. Leonis	6.5	+0.72	-2.7	+19 16.9	15 23.2	- 5 7.1	-0.1540	0.5274	-0.1660	+33	-40
η Leonis	3.6	0.60	2.5	17 12.4	9 2 46.9	+ 5 55.7	+0.1382	0.5207	0.1820	+49	-26
42 Leonis	6.1	0.54	2.3	15 26.0	10 11.1	-10 53.5	+0.7066	0.5165	0.1913	+90	+ 3
46 Leonis	5.8	0.49	2.2	14 36.2	15 32.4	- 5 41.6	+0.5816	0.5135	0.1973	+80	- 5
k Leonis	5.5	0.43	2.5	14 40.5	22 59.2	+ 1 32.1	-0.9961	0.5099	0.2051	-15	-75
ι Leonis	4.1	+0.31	-2.3	+11 1.8	10 19 6.7	- 2 54.8	-1.2722	0.5017	-0 2218	-37	-79
ω Virginis	5.4	0.26	2.0	8 38.2	11 3 5.8	+ 4 51.1	-0.4103	0.4992	0.2269	+20	-63
ν Virginis	4.2	0.24	2.0	+ 7 2.3	7 11.1	+ 8 49.7	+0.4327	0.4980	0.2290	+67	-18
				NEW	*MOON.*						
ν Libræ	5.3	+0.21	-3.5	-15 54.3	15 21 33.5	- 3 50.3	+0.7204	0.5147	-0.1981	+74	- 3
22 Libræ	6.5	0.21	3.5	16 8.0	21 39.3	- 3 44.5	+0.9530	0.5148	0.1980	+74	+12
32 Libræ	5.9	0.28	3.6	16 24.0	16 8 35.3	+ 6 51.9	-0.8472	0.5206	0.1848	-12	-90
34 Libræ	6.0	0.28	3.6	16 17.9	9 48.4	+ 8 2.8	-1.1836	0.5213	0.1832	-36	-90
ζ Libræ	5.6	0.29	3.7	16 32.8	10 56.1	+ 9 8.4	-1.1168	0.5219	0.1818	-31	-90
41 Libræ	5.3	+0.32	-4.1	-19 0.2	13 53.2	-11 59.9	+1.0565	0.5236	-0.1777	+71	+20
κ Libræ	5.0	0.32	4.2	19 23.1	15 23.8	-10 32.1	+1.2088	0.5244	0.1756	+71	+34
λ Libræ	4.9	0.36	4.3	19 53.8	21 0.5	- 5 5.9	+0.8063	0.5277	0.1675	+70	+ 3
47 Libræ	5.8	0.37	4.1	19 6.9	21 50.4	- 4 17.5	-0.1900	0.5283	0.1663	+21	-53
β^1 Scorpii	2.9	0.41	4.2	19 33.5	17 2 54.4	+ 0 37.0	-0.5270	0.5313	0.1583	+ 3	-76
56 B. Scorpii	5.0	+0.41	-4.2	-19 33.3	2 54.7	+ 0 37.2	-0.5318	0.5313	-0.1583	+ 3	-77

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

OCTOBER.

THE STAR'S						AT CONJUNCTION IN R. A.								Limiting Parallels.	
Name.	Mag.	Red'ns from 1909.0.		Apparent Declination.		Washington Mean Time.			Hour Angle, H		Y	x'	y'	N.	S.
		Δα	Δδ												
		s	″	°	′	d	h	m	h	m				°	°
ω^1 Scorpii	4.3	+0.42	- 4.4	-20	25.5	17	3	33.3	+ 1	14.6	+0.3202	0.5316	-0.1573	+48	-24
ω^2 Scorpii	4.6	0.42	4.4	20	37.5		3	50.3	+ 1	31.0	+0.4950	0.5319	0.1569	+58	-14
84 B. Scorpii	6.3	0.45	4.4	20	52.7		7	14.3	+ 4	48.6	+0.2479	0.5339	0.1512	+43	-28
51 G. Scorpii	6.5	0.46	4.5	21	4.8		8	25.8	+ 5	57.8	+0.2892	0.5346	0.1492	+45	-26
58 G. Scorpii	6.2	0.47	4.2	19	59.9		9	28.3	+ 6	58.3	-1.0485	0.5352	0.1474	-30	-90
ω Ophiuchi	4.5	+0.53	- 4.4	-21	16.4		15	35.1	-11	5.8	-0.5242	0.5391	-0.1367	0	-77
24 Ophiuchi	5.5	0.65	4.7	23	0.5	18	3	0.3	- 0	4.3	-0.0700	0.5458	0.1149	+22	-46
39 Ophiuchi	5.1	0.76	4.7	24	11.4		12	35.6	+ 9	11.4	+0.2046	0.5512	0.0950	+34	-30
θ Ophiuchi	3.3	0.79	4.9	24	54.6		14	22.0	+10	54.2	+0.8196	0.5522	0.0912	+65	+ 6
191 B. Ophiuchi	6.3	0.80	4.6	24	9.7		15	45.6	-11	45.2	-0.1153	0.5530	0.0881	+16	-48
b Ophiuchi	4.4	+0.81	- 4.6	-24	5.6		16	19.6	-11	12.3	-0.2390	0.5533	-0.0869	+10	-56
51 Ophiuchi	4.8	0.84	4.4	23	53.6		18	34.2	- 9	2.4	-0.6437	0.5546	0.0819	-12	-90
63 Ophiuchi	6.1	0.97	4.2	24	52.2	19	4	51.6	+ 0	53.2	-0.3113	0.5595	0.0583	+ 3	-61
7 Sagittarii	5.5	1.01	3.9	24	17.0		8	19.0	+ 4	13.2	-1.1289	0.5611	0.0500	-47	-90
9 Sagittarii	6.0	1.02	3.9	24	21.9		8	45.5	+ 4	38.7	-1.0634	0.5613	0.0490	-42	-90
67 B. Sagittarii	6.4	+1.11	- 4.0	-25	38.4		15	6.4	+10	45.9	+0.0439	0.5640	-0.0335	+20	-39
70 B. Sagittarii	6.4	1.12	3.6	24	57.5		16	19.8	+11	56.7	-0.7254	0.5644	0.0305	-21	-90
68 G. Sagittarii	6.2	1.17	4.1	26	41.4		18	56.7	- 9	32.2	+1.0549	0.5654	0.0240	+63	+25
λ Sagittarii	2.9	1.16	3.8	25	28.4		19	4.3	- 9	24.9	-0.2475	0.5654	0.0237	+ 3	-57
69 G. Sagittarii	6.3	1.18	4.1	26	48.8		19	6.1	- 9	23.1	+1.1824	0.5654	0.0236	+63	+39
86 B. Sagittarii	6.5	+1.18	- 4.0	-26	38.5		19	28.0	- 9	2.0	+0.9902	0.5656	-0.0227	+63	+19
126 B. Sagittarii	5.7	1.26	3.0	25	6.2	20	2	13.3	- 2	31.4	-0.7447	0.5678	-0.0056	-24	-90
σ Sagittarii	2.3	1.34	3.2	26	24.7		6	35.7	+ 1	41.3	+0.6452	0.5690	+0.0056	+56	- 5
162 B. Sagittarii	6.4	1.34	2.5	25	0.0		7	54.8	+ 2	57.4	-0.8435	0.5694	0.0089	-30	-90
127 G. Sagittarii	6.4	1.36	2.4	25	4.2		8	46.8	+ 3	47.4	-0.7597	0.5696	0.0113	-25	-90
172 B. Sagittarii	5.8	+1.37	- 2.5	-24	58.4		9	38.7	+ 4	37.5	-0.8507	0.5698	+0.0135	-30	-90
189 B. Sagittarii	6.1	1.40	2.1	24	48.0		12	4.1	+ 6	57.5	-0.9924	0.5702	0.0198	-39	-90
ψ Sagittarii	4.8	1.45	2.1	25	24.9		15	6.4	+ 9	53.0	-0.2696	0.5709	0.0277	+ 3	-58
χ Sagittarii	4.9	1.50	1.5	24	41.2		19	10.8	-10	11.7	-0.9030	0.5715	0 0383	-31	-90
51 Sagittarii	5.8	1.56	1.2	24	55.1		23	39.4	- 5	53.1	-0.4585	0.5720	0.0499	- 5	-72
h Sagittarii	4.7	+1.57	- 1.2	-25	5.1		23	56.0	- 5	37.2	- 0.2698	0.5720	+0.0506	+ 5	-58
308 B. Sagittarii	6.3	1.65	- 0.5	24	10.1	21	7	16.2	+ 1	26.5	-0.7884	0.5724	0.0696	-22	-90
36 B. Capricorni	6.2	1.84	+ 1.8	22	41.6		21	55.7	- 8	26.9	-1.0223	0.5719	0.1068	-33	-90
56 B. Capricorni	6.3	1.94	2.2	24	6.4	22	2	20.1	- 4	12.4	+0.9367	0.5715	0.1177	+66	+14
17 Capricorni	5.8	1.91	2.9	21	50.7		4	52.8	- 1	45.4	-1.0949	0.5711	0.1238	-37	-90
χ Capricorni	5.3	+2.03	+ 4.0	-21	33.5		14	15.7	+ 7	16.5	-0.1199	0.5696	+0.1458	+22	-49
27 Capricorni	6.1	2.03	4.2	20	55.3		14	40.8	+ 7	40.7	-0.7132	0.5696	0.1468	-10	-90
φ Capricorni	5.3	2.05	4.5	21	1.7		17	14.5	+10	8.7	-0.2188	0.5690	0.1526	+17	-54
33 Capricorni	5.3	2.10	4.8	21	14.3		20	50.1	-10	23.6	+0.5578	0.5683	0.1606	+61	-10
35 Capricorni	6.0	2.12	4.8	21	35.4		22	8.2	- 9	8.4	+1.1277	0.5679	0.1634	+68	+28
128 B. Capricorni	6.5	+2.10	+ 5.7	-19	32.6		23	18.9	- 8	0.3	-0.7686	0.5676	+0.1660	-11	-90
37 Capricorni	5.7	2.14	5.6	20	29.3	23	1	22.0	- 6	1.7	+0.5412	0.5672	0.1703	+61	-12
ε Capricorni	4.7	2.14	5.9	19	52.4		2	18.9	- 5	6.8	+0.0750	0.5670	0.1723	+35	-37
κ Capricorni	4.8	2.16	6.4	19	16.8		4	40.9	- 2	50.0	-0.1152	0.5665	0.1772	+25	-48
143 B. Capricorni	6.1	2.18	6.1	20	2.1		4	55.1	- 2	36.4	+0.6958	0 5665	0.1777	+70	- 3
154 B. Capricorni	6.1	+2.20	+ 6.8	-19	2.7		8	31.8	+ 0	52.4	+0.3436	0.5656	+0.1850	+51	-23
161 B. Capricorni	6.4	2.24	7.5	18	20.3		13	1.4	+ 5	12.2	+0.4765	0.5645	0.1937	+60	-16
29 Aquarii (*mean*)	6.5	2.22	7.9	17	24.1		13	8.4	+ 5	19.0	-0.4504	0 5645	0.1939	+10	-70
56 Aquarii	6.1	2.31	9.8	15	2.9	24	1	8.2	- 7	7.3	-0.3639	0.5618	0.2153	+16	-63
69 Aquarii	5.6	2.37	10.6	14	32.0		8	42.0	+ 0	10.3	+0.7918	0.5602	0.2271	+75	+ 1
τ Aquarii	4.4	+2.37	+10.8	-14	4.2		9	31.3	+ 0	57.9	+0.5147	0.5601	+0.2283	+66	-14
74 Aquarii	5.8	2.36	11.6	12	5.8		11	13.3	+ 2	36.2	-1.0683	0.5597	0.2308	-22	-90
257 B. Aquarii	6.3	2.40	11.4	13	33.3		13	53.1	+ 5	10.4	+1.0081	0.5591	0.2344	+76	+15
290 B. Aquarii	6.3	2.43	12.6	11	10.8		20	29.6	+11	32.6	+0.2153	0.5581	0.2429	+50	-30
ψ^1 Aquarii	4.5	2.44	13.0	9	34.8		21	1.0	-11	56.9	-1.2495	0.5580	0.2435	-37	-90
ψ^2 Aquarii	4.6	+2.43	+13.1	- 9	40.5		21	54.9	-11	4.9	-0.9346	0.5578	+0.2445	-12	-90

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

OCTOBER.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1909.0.		Apparent Declination.	Washington Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
		Δα	Δδ								
		s	″	° ′	d h m	h m				°	°
ψ^3 Aquarii	5.2	+2.44	+13.0	−10 6.3	**24** 22 22.6	−10 38.1	−0.3945	0.5578	+0.2451	+18	−65
336 B. Aquarii	6.3	2.47	13.4	9 45.8	**25** 2 47.9	− 6 22.1	+0.3608	0.5572	0.2500	+60	−23
351 B. Aquarii	6.5	2.47	14.0	7 57.9	5 40.3	− 3 35.9	−0.7009	0.5569	0.2528	+ 3	−90
376 B. Aquarii	6.3	2.50	14.6	6 52.9	11 24.4	+ 1 56.2	−0.3063	0.5565	0.2579	+24	−59
30 Piscium	4.7	2.54	15.0	6 30.9	17 19.7	+ 7 39.0	+0.8724	0.5563	0.2623	+83	+ 5
33 Piscium	4.7	+2.54	+15.2	− 6 12.7	18 49.4	+ 9 5.6	+0.9654	0.5563	+0.2632	+84	+11
24 B. Ceti	6.0	2.56	15.4	5 45.0	21 1.2	+11 12.8	+1.0883	0.5563	0.2644	+84	+19
54 B. Ceti	6.3	2.58	16.1	2 43.1	**26** 3 17.0	− 6 44.7	−0.2305	0.5564	0.2674	+29	−54
14 Ceti	5.4	2.61	16.5	− 1 0.1	8 8.9	− 2 3.0	−0.6125	0.5568	0.2689	+10	−81
26 Ceti	6.0	2.66	17.0	+ 0 53.0	20 34.6	+ 9 56.5	+0.8902	0.5585	0.2697	+90	+ 6
33 Ceti	6.1	+2.67	+17.1	+ 1 58.0	23 31.8	−11 12.5	+0.6253	0.5590	+0.2693	+82	− 9
SATURN	. .	. . .	. . .	4 45.0	**27** 2 40.0	− 8 11.0	−1.2572	0.5627	0.2696	−34	−85
f Piscium	5.1	2.68	17.2	3 8.4	2 41.4	− 8 9.6	+0.3249	0.5598	0.2684	+60	−24
μ Piscium	5.0	2.73	17.4	5 40.8	8 3.2	− 2 59.3	−0.7273	0.5610	0 2663	+ 3	−83
ν Piscium	4.6	2.73	17.3	5 1.9	12 56.6	+ 1 43.7	+1.2034	0.5624	0.2637	+90	+30
ξ Arietis	5.5	+2.80	+16.6	+10 12.2	**28** 7 27.0	− 4 26.2	+0.8835	0.5687	+0.2472	+90	+ 9
31 Arietis	5.7	2.84	16.2	12 3.5	12 23.8	+ 0 19.7	+0.2718	0.5707	0.2410	+57	−24
38 Arietis	5.2	2.84	15.9	12 4.1	15 53.3	+ 3 41.5	+1.0962	0.5720	0.2362	+90	+25
σ Arietis	5.5	2.86	15.6	14 42.7	18 35.3	+ 6 17.5	−0.8704	0.5731	0.2323	− 6	−75
145 B. Arietis	6.5	2.88	14.9	15 30.4	**29** 0 2.5	+11 32.3	−0.4106	0.5753	0.2237	+20	−59
26 B. Tauri	6.4	+2.91	+13.3	+17 32.3	12 3.9	− 0 53.6	+0.1446	0.5801	+0.2017	+50	−26
13 Tauri	5.6	2.93	12.9	19 24.8	15 21.2	+ 2 16.1	−1.0596	0.5813	0.1950	−21	−71
14 Tauri	6.2	2.93	12.8	19 22.9	15 56.6	+ 2 50.1	−0.9141	0.5816	0.1938	−10	−71
43 Tauri	5.5	2.92	11.5	19 22.3	**30** 2 7.2	−11 22.9	+0.9559	0.5851	0.1714	+90	+23
ω Tauri	4.8	2.92	10.8	20 21.5	5 20.0	− 8 17.6	+0.5129	0.5860	0.1639	+76	− 3
51 Tauri	5.6	+2.94	+10.6	+21 21.6	5 45.6	− 7 53.0	−0.4176	0.5861	+0.1629	+19	−52
53 Tauri	5.3	2.93	10.6	20 55.5	6 11.1	− 7 28.5	+0.0854	0.5862	0.1618	+47	−25
56 Tauri	5.2	2.94	10.5	21 33.4	6 14.8	− 7 25.0	−0.5352	0.5862	0.1616	+12	−59
224 B. Tauri	6.1	2.92	10.5	20 36.6	7 21.5	− 6 20.9	+0.5893	0.5865	0.1590	+83	+ 2
227 B. Tauri	5.9	2.92	10.4	20 46.4	7 49.0	− 5 54.4	+0.4985	0.5866	0.1579	+75	− 3
κ Tauri	4.1	+2.94	+10.1	+22 5.3	8 31.0	− 5 14.1	−0.7065	0.5868	+0.1562	+ 2	−68
67 Tauri	5.4	2.94	10.1	21 59.7	8 32.3	− 5 12.8	−0.6094	0.5868	0.1561	+ 8	−63
υ Tauri	4.2	2.95	9.9	22 36.6	8 52.9	− 4 53.0	−1.1713	0.5869	0.1552	−33	−67
72 Tauri	5.4	2.95	9.9	22 47.7	9 16.3	− 4 30.6	−1.2952	0.5870	0.1543	−52	−67
247 B. Tauri	5.8	2.93	10.0	21 25.2	9 34.5	− 4 13.1	+0.1261	0.5870	0.1536	+49	−22
284 B. Tauri	6.0	+2.95	+ 9.1	+23 9.5	12 53.7	− 1 1.8	−1.1186	0.5878	+0.1453	−28	−67
τ Tauri	4.5	2.93	8.9	22 47.1	15 10.5	+ 1 9.7	−0.4215	0.5884	0.1394	+18	−50
300 B. Tauri	6.2	2.94	8.6	23 27.8	16 31.7	+ 2 27.6	−0.9170	0.5886	0.1359	−12	−67
99 Tauri	6.0	2.92	7.7	23 48.5	21 16.7	+ 7 1.4	−0.6500	0.5893	0.1235	+ 5	−63
103 Tauri	5.5	2.91	7.0	24 8.8	**31** 1 18.7	+10 53.7	−0.5163	0.5898	0.1127	+13	−54
118 Tauri	5.4	+2.87	+ 5.4	+25 4.7	9 34.9	− 5 9.8	−0.6240	0.5900	+0.0899	+ 6	−59
121 Tauri	5.1	2.83	5.2	23 58.9	12 1.0	− 2 49.5	+0.7021	0.5899	0.0831	+90	+16
125 Tauri	5.1	2.86	4.5	25 50.9	13 39.8	− 1 14.7	−1.0645	0.5898	0.0785	−25	−64
132 Tauri	5.0	2.80	4.2	24 32.3	17 19.3	+ 2 16.0	+0.5376	0.5893	0.0682	+79	+ 8
412 B. Tauri	5.8	2.77	3.8	24 14.3	20 26.0	+ 5 15.4	+1.0453	0.5889	0.0594	+90	+40
139 Tauri	4.7	+2.80	+ 3.2	+25 56.6	20 49.2	+ 5 37.6	−0.6773	0.5888	+0.0582	+ 3	−61

NOVEMBER.

Name.	Mag.	Δα	Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
5 Geminorum	5.9	+2.72	+ 2.7	+24 26.5	**1** 2 10.4	+10 46.2	+1.1351	0.5878	+0.0431	+90	+48
52 B. Geminorum	6.5	+2.62	+ 1.0	+24 40.0	12 26.1	− 3 22.4	+1.2044	0.5845	+0.0141	+90	+57
ε Geminorum	3.2	2.60	+ 0.4	25 13.3	15 0.6	− 0 53.9	+0.6589	0.5835	+0.0069	+90	+20
37 Geminorum	5.7	2.55	− 0.4	25 29.4	19 34.3	+ 3 29.1	+0.3852	0.5815	−0.0057	+67	+ 5
39 Geminorum	6.2	2.54	0.8	26 12.1	20 58.0	+ 4 49.6	−0.3649	0.5808	0.0095	+21	−36
40 Geminorum	6.3	2.55	0.9	26 2.3	21 14.1	+ 5 5.1	−0.1979	0.5806	0.0102	+30	−26
52 Geminorum	6.1	+2.46	− 1.6	+25 2.6	**2** 3 25.9	+11 2.6	+0.7252	0.5776	−0.0269	+90	+22

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

NOVEMBER.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1909.0. Δα	Red'ns from 1909.0. Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
		s	"	° '	d h m	h m				°	°
134 B. Geminorum	6.5	+2.48	-2.4	+26 51.2	**2** 4 21.8	+11 56.3	-1.1935	0.5769	-0.0294	-40	-63
A Geminorum	5.1	2.41	2.1	25 13.5	7 1.7	- 9 29.8	+0.4222	0.5754	0.0364	+70	+ 4
176 B. Geminorum	6.3	2.33	2.8	24 33.8	13 8.6	- 3 36.7	+0.8482	0.5716	0.0522	+90	+27
181 B. Geminorum	6.0	2.32	2.8	24 25.7	13 32.8	- 3 13.4	+0.9696	0.5714	0.0532	+90	+35
κ Geminorum	3.6	2.29	3.2	24 37.0	15 44.2	- 1 6.9	+0.6509	0.5699	0.0587	+90	+15
ω^1 Cancri	6.0	+2.22	-4.5	+25 38.5	22 40.9	+ 5 34.4	-0.8995	0.5650	-0.0756	-12	-64
5 B. Cancri	6.4	2.19	3.9	23 50.0	22 44.9	+ 5 38.3	+1.0103	0.5650	0.0757	+90	+35
4 Cancri	6.2	2.21	4.4	25 20.4	23 1.8	+ 5 54.6	-0.6064	0.5648	0.0764	+ 7	-57
35 B. Cancri	6.4	2.11	4.4	23 24.6	**3** 4 11.8	+10 53.5	+1.0136	0.5610	0.0885	+90	+34
λ Cancri	5.9	2.08	5.1	24 18.5	7 9.0	-10 15.7	-0.2109	0.5589	0.0951	+30	-35
28 Cancri	6.1	+2.04	-5.6	+24 26.7	10 41.0	- 6 51.2	-0.7086	0.5562	-0.1029	+ 1	-65
υ^1 Cancri	5.7	2.02	5.7	24 23.2	11 57.8	- 5 37.1	-0.7796	0.5551	0.1056	- 3	-66
υ^2 Cancri	6.4	2.01	5.8	24 23.6	12 37.3	- 4 59.0	-0.8569	0.5546	0.1070	- 8	-66
ξ Cancri	5.2	1.77	6.7	22 24.7	**4** 5 5.9	+10 55.7	-0.7769	0.5419	0.1395	- 2	-68
79 Cancri	6.1	1.76	6.8	22 21.9	5 33.5	+11 22.4	-0.7900	0.5416	0.1404	- 3	-68
90 H'. Cancri	6.1	+1.73	-6.6	+21 39.4	7 5.4	-11 8.7	-0.2441	0.5403	-0.1431	+28	-41
57 B. Leonis	6.5	1.52	7.1	19 16.8	21 48.7	+ 3 6.0	+0.0399	0.5291	0.1673	+44	-29
η Leonis	3.6	1.37	7.1	17 12.3	**5** 9 5.7	- 9 58.1	+0.3239	0.5213	0.1831	+61	-17
42 Leonis	6.1	1.27	7.0	15 26.0	16 26.7	- 2 50.5	+0.8844	0.5165	0.1923	+90	+13
46 Leonis	5.8	1.21	6.9	14 36.2	21 46.3	+ 2 19.6	+0.7561	0.5133	0.1983	+90	+ 4
k Leonis	5.5	+1.12	-7.4	+14 40.4	**6** 5 11.3	+ 9 31.7	-0.8210	0.5091	-0.2059	- 3	-75
ι Leonis	4.1	0.93	7.0	11 1.7	**7** 1 17.4	+ 5 3.4	-1.1183	0.4999	0.2223	-22	-79
ω Virginis	5.4	0.84	6.5	8 38.2	9 16.9	-11 10.4	-0.2683	0.4972	0.2272	+28	-55
ξ Virginis	4.8	0.81	6.6	8 45.7	13 3.0	- 7 30.5	-1.2687	0.4961	0.2293	-35	-81
ν Virginis	4.2	0.80	6.3	7 2.3	13 22.6	- 7 11.4	+0.5677	0.4960	0.2294	+78	-11
36 B. Virginis	6.5	+0.71	-6.2	+ 6 3.9	23 20.9	+ 2 30.6	-0.6639	0.4938	-0.2337	+ 7	-83
c Virginis	5.1	0.63	5.8	3 49.1	**8** 8 40.8	+11 35.5	-0.3646	0.4925	0.2366	+23	-62
250 B. Virginis	5.9	0.58	5.6	+ 2 21.2	18 49.9	- 2 31.7	-1.1502	0.4919	0.2383	-24	-88
65 Virginis	6.0	0.44	4.6	- 4 27.0	**9** 20 6.2	- 1 56.2	+0.3877	0.4944	0.2367	+64	-21
66 Virginis	5.7	0.44	4.6	4 41.4	20 47.1	- 1 16.4	+0.4928	0.4945	0.2365	+71	-16
72 Virginis	6.1	+0.42	-4.4	- 6 0.1	**10** 0 3.8	+ 1 55.0	+1.1754	0.4952	-0.2356	+84	+26
l Virginis	4.8	0.41	4.5	5 47.2	0 55.8	+ 2 45.7	+0.7330	0.4955	0.2354	+84	- 3
80 Virginis	5.6	0.41	4.5	4 56.0	2 54.7	+ 4 41.3	-0.6795	0.4960	0.2347	+ 5	-88
				NEW	*MOON.*						
39 Ophiuchi	5.1	+0.58	-4.0	-24 11.4	**14** 18 13.8	- 7 23.1	+0.1155	0.5543	-0.0964	+29	-35
θ Ophiuchi	3.3	0.60	4.1	24 54.6	19 59.4	- 5 41.1	+0.7290	0.5552	0.0925	+65	0
191 B. Ophiuchi	6.3	0.60	3.9	24 9.7	21 22.5	- 4 21.0	-0.2064	0.5559	0.0894	+12	-54
b Ophiuchi	4.4	0.61	4.0	24 5.6	21 56.2	- 3 48.4	-0.3305	0.5562	0.0882	+ 5	-63
51 Ophiuchi	4.8	0.63	3.9	23 53.6	**15** 0 10.1	- 1 39.2	-0.7367	0.5573	0.0832	-17	-90
63 Ophiuchi	6.1	+0.72	-3.7	-24 52.2	10 24.3	+ 8 13.3	-0.4114	0.5619	-0.0592	- 2	-69
7 Sagittarii	5.5	0.75	3.5	24 17.0	13 51.0	+11 32.6	-1.2323	0.5632	0.0509	-57	-90
9 Sagittarii	6.0	0.75	3.5	24 21.8	14 17.3	+11 57.9	-1.1669	0.5634	0.0498	-50	-90
67 B. Sagittarii	6.4	0.82	3.5	25 38.4	20 37.2	- 5 55.9	-0.0617	0.5656	0.0342	+14	-45
70 B. Sagittarii	6.4	0.83	3.3	24 57.5	21 50.5	- 4 45.2	-0.8333	0.5659	0.0312	-28	-90
68 G. Sagittarii	6.2	+0.86	-3.6	-26 41.4	**16** 0 27.3	- 2 14.2	+0.9498	0.5667	-0.0246	+63	+16
λ Sagittarii	2.9	0.86	3.4	25 28.4	0 34.9	- 2 6.9	-0.3558	0.5667	0.0243	- 2	-65
69 G. Sagittarii	6.3	0.87	3.6	26 48.8	0 36.7	- 2 5.1	+1.0776	0.5667	0.0242	+63	+27
86 B. Sagittarii	6.5	0.86	3.6	26 38.5	0 58.5	- 1 44.1	+0.8845	0.5669	0.0233	+63	+11
126 B. Sagittarii	5.7	0.93	2.9	25 6.2	7 44.0	+ 4 46.6	-0.8584	0.5684	0.0061	-32	-90
Venus	. .	. . .	. .	-26 0.7	11 18.8	+ 8 13.5	+0.1052	0.5225	-0.0007	+20	-36
σ Sagittarii	2.3	+0.99	-3.0	26 24.7	12 6.9	+ 8 59.8	+0.5348	0.5693	+0.0052	+47	-11
162 B. Sagittarii	6.4	0.99	2.5	25 0.0	13 26.2	+10 16.1	-0.9607	0.5694	0.0086	-38	-90
127 G. Sagittarii	6.4	1.01	2.4	25 4.2	14 18.3	+11 6.3	-0.8768	0.5696	0.0108	-33	-90
172 B. Sagittarii	5.8	1.01	2.5	24 58.4	15 10.4	+11 56.5	-0.9687	0.5697	0.0131	-38	-90
189 B. Sagittarii	6.1	+1.04	-2.2	-24 48.0	17 36.4	- 9 43.1	-1.1123	0.5699	+0.0194	-48	-90

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

NOVEMBER.

The Star's					At Conjunction in R. A.						Limiting Parallels.	
Name.	Mag.	Red'ns from 1909.0. Δα	Red'ns from 1909.0. Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
		s	"	° '	d h m	h m				°	°
ψ Sagittarii	4.8	+1.08	− 2.2	−25 24.9	16 20 39.6	− 6 46.5	−0.3872	0.5702	+0.0273	− 4	−67
χ Sagittarii	4.9	1.12	1.8	24 41.2	17 0 45.6	− 2 49.6	−1.0257	0.5703	0.0379	−40	−90
51 Sagittarii	5.8	1.18	1.5	24 55.2	5 16.2	+ 1 31.1	−0.5805	0.5703	0.0495	−11	−84
h Sagittarii	4.7	1.19	1.5	25 5.1	5 32.9	+ 1 47.1	−0.3904	0.5703	0.0502	− 2	−67
308 B. Sagittarii	6.3	1.26	− 1.1	24 10.1	12 57.4	+ 8 55.1	−0.9154	0.5699	0.0691	−29	−90
36 B. Capricorni	6.2	+1.43	+ 0.8	−22 41.6	18 3 49.5	− 0 45.8	−1.1554	0.5674	+0.1059	−44	−90
56 B. Capricorni	6.3	1.53	1.1	24 6.4	8 18.6	+ 3 33.6	+0.8235	0.5663	0.1166	+66	+ 6
17 Capricorni	5.8	1.51	1.7	21 50.7	10 54.2	+ 6 3.5	−1.2304	0.5657	0.1227	−51	−90
χ Capricorni	5.3	1.62	2.5	21 33.5	20 29.3	− 8 42.3	−0.2445	0.5630	0.1443	+15	−56
27 Capricorni	6.1	1.62	2.7	20 55.3	20 55.0	− 8 17.6	−0.8454	0.5628	0.1452	−18	−90
φ Capricorni	5.3	+1.65	+ 3.0	−21 1.7	23 32.4	− 5 45.8	−0.3445	0.5620	+0.1509	+11	−63
33 Capricorni	5.3	1.70	3.1	21 14.3	19 3 13.5	− 2 12.7	+0.4427	0.5610	0.1587	+54	−17
35 Capricorni	6.0	1.72	3.2	21 35.4	4 33.6	− 0 55.4	+1.0207	0.5604	0.1614	+68	+18
128 B. Capricorni	6.5	1.71	4.0	19 32.6	5 46.3	+ 0 14.6	−0.9016	0.5601	0.1640	−19	−90
37 Capricorni	5.7	1.74	3.9	20 29.4	7 52.6	+ 2 16.4	+0.4269	0.5594	0.1682	+54	−18
ε Capricorni	4.7	+1.75	+ 4.2	−19 52.4	8 51.1	+ 3 12.9	−0.0456	0.5591	+0.1701	+28	−44
κ Capricorni	4.8	1.78	4.6	19 16.8	11 17.2	+ 5 33.8	−0.2381	0.5584	0.1749	+19	−56
143 Capricorni	6.1	1.79	4.3	20 2.1	11 31.8	+ 5 47.8	+0.5848	0.5582	0.1754	+64	−10
154 Capricorni	6.1	1.82	4.9	19 2.8	15 14.9	+ 9 23.0	+0.2284	0.5569	0.1825	+44	−29
161 Capricorni	6.4	1.87	5.5	18 20.4	19 52.7	−10 8.9	+0.3651	0.5555	0.1910	+53	−22
29 Aquarii (*mean*)	6.5	+1.85	+ 6.0	−17 24.1	20 0.0	−10 1.9	−0.5763	0.5554	+0.1912	+ 3	−80
56 Aquarii	6.1	1.97	7.7	15 2.9	20 8 23.7	+ 1 56.0	−0.4844	0.5517	0.2118	+10	−72
69 Aquarii	5.6	2.05	8.5	14 32.0	16 13.6	+ 9 29.7	+0.6945	0.5495	0.2233	+75	− 5
τ Aquarii	4.4	2.06	8.7	14 4.2	17 4.7	+10 19.0	+0.4132	0.5493	0.2246	+60	−20
74 Aquarii	5.8	2.06	9.5	12 5.9	18 50.5	−11 58.8	−1.1962	0.5489	0.2269	−33	−90
257 B. Aquarii	6.3	+2.10	+ 9.2	−13 33.4	21 36.2	− 9 18.8	+0.9179	0.5483	+0.2305	+76	+ 9
290 B. Aquarii	6.3	2.15	10.5	11 10.8	21 4 27.6	− 2 41.5	+0.1154	0.5469	0.2387	+45	−36
ψ² Aquarii	4.6	2.16	11.0	9 40.6	5 56.2	− 1 15.7	−1.0538	0.5467	0.2403	−20	−90
ψ³ Aquarii	5.2	2.17	10.9	10 6.3	6 25.0	− 0 48.0	−0.5039	0.5466	0.2408	+13	−73
336 B. Aquarii	6.3	2.21	11.3	9 45.8	11 0.5	+ 3 38.2	+0.2679	0.5459	0.2456	+54	−28
351 B. Aquarii	6.5	+2.23	+12.1	− 7 57.9	13 59.5	+ 6 31.1	−0.8104	0.5455	+0.2484	− 3	−90
376 B. Aquarii	6.3	2.29	12.7	6 52.9	19 57.0	−11 43.4	−0.4041	0.5451	0.2534	+19	−66
30 Piscium	4.7	2.35	13.1	6 31.0	22 2 6.0	− 5 46.8	+0.8002	0.5449	0.2577	+83	+ 1
33 Piscium	4.7	2.36	13.3	6 12.8	3 39.1	− 4 16.8	+0.8960	0.5450	0.2587	+84	+ 6
24 B. Ceti	6.0	2.38	13.5	5 45.0	5 56.0	− 2 4.5	+1.0230	0.5450	0.2600	+84	+15
54 B. Ceti	6.3	+2.43	+14.5	− 2 43.1	12 26.0	+ 4 12.3	−0.3128	0.5454	+0.2630	+25	−60
14 Ceti	5.4	2.48	15.1	− 1 0.1	17 28.7	+ 9 4.9	−0.6961	0.5461	0.2646	+ 5	−90
26 Ceti	6.0	2.60	15.8	+ 0 53.0	23 6 20.6	− 2 29.5	+0.8429	0.5486	0.2659	+90	+ 3
33 Ceti	6.1	2.63	16.0	1 58.0	9 23.6	+ 0 27.3	+0.5771	0.5494	0.2656	+78	−12
f Piscium	5.1	2.66	16.3	3 8.4	12 39.2	+ 3 36.3	+0.2755	0.5503	0.2650	+57	−27
μ Piscium	5.0	+2.73	+16.8	+ 5 40.8	18 10.9	+ 8 56.5	−0.7852	0.5522	+0.2632	0	−84
ν Piscium	4.6	2.76	16.5	5 1.9	23 12.7	−10 12.1	+1.1755	0.5543	0.2609	+90	+27
ξ Arietis	5.5	2.95	16.5	10 12.2	24 18 9.6	+ 8 4.7	+0.8686	0.5630	0.2457	+90	+ 8
31 Arietis	5.7	3.02	16.3	12 3.5	23 11.8	−11 3.9	+0.2564	0.5656	0.2399	+56	−24
38 Arietis	5.2	3.04	16.0	12 4.1	25 2 44.7	− 7 38.8	+1.0902	0.5675	0.2354	+90	+23
σ Arietis	5.5	+3.08	+16.2	+14 42.7	5 29.0	− 5 0.6	−0.8876	0.5692	+0.2316	− 7	−75
145 B. Arietis	6.5	3.13	15.5	15 30.4	11 0.3	+ 0 18.4	−0.4187	0.5722	0.2235	+19	−59
26 B. Tauri	6.4	3.25	14.0	17 32.3	23 7.4	+11 58.2	+0.1508	0.5790	0.2022	+50	−25
13 Tauri	5.6	3.30	13.9	19 24.8	26 2 25.5	− 8 51.3	−1.0533	0.5808	0.1957	−20	−71
14 Tauri	6.2	3.31	13.8	19 22.9	3 1.0	− 8 17.2	−0.9069	0.5812	0.1945	−10	−71
43 Tauri	5.5	+3.36	+12.2	+19 22.3	13 11.7	+ 1 29.9	+0.9736	0.5862	+0.1726	+90	+24
ω Tauri	4.8	3.38	11.6	20 21.5	16 23.9	+ 4 34.5	+0.5328	0.5878	0.1651	+77	− 2
51 Tauri	5.6	3.42	11.6	21 21.6	16 49.4	+ 4 59.0	−0.3965	0.5880	0.1642	+20	−51
53 Tauri	5.3	3.40	11.5	20 55.6	17 14.8	+ 5 23.4	+0.1064	0.5882	0.1631	+48	−23
56 Tauri	5.2	3.42	11.5	21 33.4	17 18.4	+ 5 26.8	−0.5136	0.5882	0.1630	+14	−58
224 B. Tauri	6.1	+3.40	+11.3	+20 36.6	18 24.9	+ 6 30.7	+0.6105	0.5887	+0.1603	+85	+ 3

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

NOVEMBER.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1909.0.		Apparent Declination.	Washington Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
		Δα	Δδ								
		s	"	° '	d h m	h m				°	°
227 B. Tauri	5.9	+3.41	+11.2	+20 46.4	**26** 18 52.2	+ 6 57.0	+0.5201	0.5888	+0.1592	+76	− 2
κ Tauri	4.1	3.44	11.1	22 5.4	19 34.0	+ 7 37.1	−0.6826	0.5891	0.1576	+ 4	−67
67 Tauri	5.4	3.44	11.1	21 59.7	19 35.3	+ 7 38.3	−0.5857	0.5891	0.1575	+ 9	−62
υ Tauri	4.2	3.45	11.0	22 36.6	19 55.7	+ 7 58.0	−1.1464	0.5892	0.1567	−30	−67
72 Tauri	5.4	3.45	11.0	22 47.7	20 19.0	+ 8 20.3	−1.2697	0.5895	0.1557	−46	−67
247 B. Tauri	5.8	+3.43	+10.8	+21 25.2	20 37.1	+ 8 37.7	+0.1495	0.5896	+0.1550	+51	−20
284 B. Tauri	6.0	3.48	10.2	23 9.5	23 55.0	+11 47.7	−1.0899	0.5909	0.1468	−25	−67
τ Tauri	4.5	3.47	9.8	22 47.1	**27** 2 10.6	−10 1.9	−0.3926	0.5917	0.1410	+20	−48
300 B. Tauri	6.2	3.49	9.6	23 27.9	3 31.0	− 8 44.8	−0.8855	0.5923	0.1375	− 9	−67
99 Tauri	6.0	3.50	8.6	23 48.6	8 13.1	− 4 14.0	−0.6155	0.5936	0.1251	+ 7	−61
103 Tauri	5.5	+3.52	+ 7.8	+24 8.9	12 12.1	− 0 24.6	−0.4791	0.5946	+0.1142	+15	−52
118 Tauri	5.4	3.54	5.9	25 4.7	20 21.0	+ 7 24.5	−0.5806	0.5960	0.0914	+ 9	−56
121 Tauri	5.1	3.51	5.5	23 58.9	22 44.6	+ 9 42.2	+0.7386	0.5961	0.0846	+90	+17
125 Tauri	5.1	3.56	5.0	25 50.9	**28** 0 21.7	+11 15.4	−1.0153	0.5962	0.0799	−20	−64
132 Tauri	5.0	3.51	4.3	24 32.3	3 57.1	− 9 18.0	+0.5776	0.5964	0.0695	+83	+10
412 B. Tauri	5.8	+3.50	+ 3.7	+24 14.3	7 0.1	− 6 22.4	+1.0826	0.5962	+0.0606	+90	+43
139 Tauri	4.7	3.54	3.4	25 56.7	7 22.9	− 6 0.5	−0.6263	0.5962	0.0595	+ 6	−57
5 Geminorum	5.9	3.48	2.4	24 26.5	12 37.3	− 0 58.8	+1.1735	0.5955	0.0441	+90	+52
52 B. Geminorum	6.5	3.43	+ 0.2	24 40.0	22 38.7	+ 8 38.3	+1.2453	0.5929	0.0147	+90	+61
ε Geminorum	3.2	3.43	− 0.4	25 13.3	**29** 1 9.5	+11 3.1	+0.7060	0.5921	+0.0074	+90	+22
37 Geminorum	5.7	+3.40	− 1.4	+25 29.4	5 36.2	− 8 40.9	+0.4366	0.5903	−0.0054	+71	+ 8
39 Geminorum	6.2	3.41	1.8	26 12.0	6 57.8	− 7 22.5	−0.3049	0.5896	0.0093	+24	−32
40 Geminorum	6.3	3.41	1.9	26 2.3	7 13.5	− 7 7.4	−0.1397	0.5895	0.0101	+34	−23
47 Geminorum	5.6	3.40	3.1	27 0.3	11 54.8	− 2 37.2	−1.2183	0.5872	0.0233	−44	−63
52 Geminorum	6.1	3.34	3.0	25 2.6	13 15.4	− 1 19.8	+0.7754	0.5864	0.0271	+90	+25
134 B. Geminorum	6.5	+3.38	− 3.7	+26 51.2	14 9.9	− 0 27.5	−1.1218	0.5860	−0.0296	−31	−63
A Geminorum	5.1	3.30	3.7	25 13.5	16 45.4	+ 2 2.0	+0.4766	0.5845	0.0368	+74	+ 8
176 B. Geminorum	6.3	3.24	4.8	24 33.8	22 42.3	+ 7 45.0	+0.8993	0.5806	0.0528	+90	+30
181 B. Geminorum	6.0	3.23	4.8	24 25.7	23 5.8	+ 8 7.6	+1.0194	0.5803	0.0539	+90	+38
κ Geminorum	3.6	3.21	5.3	24 36.9	**30** 1 13.6	+10 10.5	+0.7049	0.5790	0.0595	+90	+18
ω^1 Cancri	6.0	+3.16	− 6.8	+25 38.4	7 58.7	− 7 19.8	−0.8258	0.5741	−0.0767	− 7	−64
5 B. Cancri	6.4	3.12	6.4	23 49.9	8 2.5	− 7 16.1	+1.0615	0.5740	0.0768	+90	+39
4 Cancri	6.2	3.15	6.8	25 20.3	8 19.0	− 7 0.2	−0.5360	0.5738	0.0775	+12	−52
35 B. Cancri	6.4	3.04	7.2	23 24.6	13 20.4	− 2 10.1	+1.0658	0.5699	0.0898	+90	+38
λ Cancri	5.9	3.03	8.0	24 18.4	16 12.7	+ 0 35.9	−0.1436	0.5675	0.0965	+34	−31
28 Cancri	6.1	+2.99	− 8.6	+24 26.7	19 38.9	+ 3 54.5	−0.6349	0.5646	−0.1044	+ 6	−61
υ^1 Cancri	5.7	2.97	8.8	24 23.2	20 53.5	+ 5 6.4	−0.7050	0.5636	0.1073	+ 2	−65
υ^2 Cancri	6.4	2.96	8.9	24 23.5	21 32.0	+ 5 43.5	−0.7811	0.5631	0.1086	− 3	−66
DECEMBER.											
ξ Cancri	5.2	+2.72	−10.7	+22 24.7	**1** 13 34.7	− 2 47.7	−0.7011	0.5492	−0.1416	+ 2	−67
79 Cancri	6.1	2.72	10.7	22 21.8	14 1.5	− 2 21.8	−0.7141	0.5488	0.1423	+ 2	−68
90 H'. Cancri	6.1	2.68	10.7	21 39.3	15 31.2	− 0 55.2	−0.1742	0.5475	0.1451	+32	−38
57 B. Leonis	6.5	2.46	11.8	19 16.7	**2** 5 53.8	−11 1.1	+0.1066	0.5352	0.1693	+48	−26
η Leonis	3.6	+2.29	−12.1	+17 12.2	16 56.9	− 0 19.1	+0.3872	0.5262	−0.1850	+65	−13
42 Leonis	6.1	2.18	12.2	15 25.9	**3** 0 9.9	+ 6 40.4	+0.9419	0.5207	0.1940	+90	+17
46 Leonis	5.8	2.11	12.3	14 36.1	5 24.1	+11 45.1	+0.8145	0.5170	0.1999	+90	+ 8
k Leonis	5.5	2.02	12.9	14 40.3	12 42.6	− 5 9.4	−0.7513	0.5122	0.2074	+ 1	−74
ι Leonis	4.1	1.77	12.8	11 1.6	**4** 8 35.1	− 9 51.2	−1.0533	0.5012	0.2232	−17	−79
ω Virginis	5.4	+1.66	−12.2	+ 8 38.1	16 31.0	− 2 8.6	−0.2109	0.4978	−0.2279	+31	−52
ξ Virginis	4.8	1.63	12.4	8 45.6	20 15.8	+ 1 30.0	−1.2078	0.4965	0.2298	−29	−81
ν Virginis	4.2	1.62	12.0	7 2.2	20 35.2	+ 1 48.9	+0.6197	0.4964	0.2299	+82	− 8
π Virginis	4.6	1.53	12.1	7 7.1	**5** 4 54.3	+ 9 54.3	−1.3996	0.4939	0.2334	−57	−83
36 B. Virginis	6.5	1.50	11.8	6 3.8	6 30.8	+11 28.2	−0.6096	0.4934	0.2340	+10	−79
c Virginis	5.1	+1.40	−11.3	+ 3 49.0	15 49.3	− 3 28.5	−0.3153	0.4916	−0.2365	+25	−59

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

DECEMBER.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1909.0.		Apparent Declination.	Washington Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
		$\Delta\alpha$	$\Delta\delta$								
		s	"	° '	d h m	h m				°	°
250 B. Virginis	5.9	+1.32	−11.0	+ 2 21.1	**6** 1 57.8	+ 6 23.7	−1.1028	0.4906	−0.2381	−20	−88
65 Virginis	6.0	1.12	9.1	− 4 27.1	**7** 3 15.7	+ 7 0.9	+0.4213	0.4926	0.2361	+66	−20
66 Virginis	5.7	1.12	9.1	4 41.5	3 56.7	+ 7 40.8	+0.5262	0.4927	0.2360	+73	−14
72 Virginis	6.1	1.09	8.6	6 0.2	7 13.8	+10 52.6	+1.2062	0.4934	0.2352	+84	+29
l Virginis	4.8	1.08	8.8	5 47.3	8 5.8	+11 43.1	+0.7643	0.4937	0.2348	+84	− 1
80 Virginis	5.6	+1.07	− 8.9	− 4 56.1	10 4.9	−10 20.9	−0.6465	0.4942	−0.2343	+ 7	−85
88 Virginis	6.5	1.02	8.6	6 23.2	17 10.1	− 3 27.4	−0.6902	0.4963	0.2315	+ 4	−90
598 B. Virginis	6.1	0.99	8.3	7 36.8	20 50.7	+ 0 7.2	−0.1795	0.4975	0.2299	+31	−52
623 B. Virginis	6.5	0.97	7.9	8 49.4	**8** 1 58.4	+ 5 6.3	−0.0143	0.4995	0.2272	+39	−43
95 Virginis	5.4	0.95	7.9	8 52.9	3 15.8	+ 6 21.6	−0.2417	0.5000	0.2265	+27	−55
96 Virginis	6.5	+0.95	− 7.5	− 9 54.4	4 29.7	+ 7 33.4	+0.6115	0.5005	−0.2257	+76	− 9
κ Virginis	4.2	0.94	7.5	9 51.2	6 36.3	+ 9 36.5	+0.0776	0.5014	0.2245	+43	−38
2 Libræ	6.3	0.91	7.3	11 18.0	12 16.3	− 8 53.0	+0.4153	0.5041	0.2207	+62	−20
4 G. Libræ	6.5	0.91	7.3	11 15.5	12 56.9	− 8 13.6	+0.2197	0.5043	0.2202	+51	−30
6 B. Libræ	6.2	0.82	6.7	11 55.2	19 32.7	− 1 49.1	−0.4864	0.5077	0.2151	+13	−72
22 B. Libræ	6.4	+0.85	− 7.0	−12 27.5	**9** 1 14.0	+ 3 42.4	−1.1016	0.5109	−0.2101	−25	−90
μ Libræ	5.4	0.85	6.6	13 46.3	1 57.4	+ 4 24.6	+0.1922	0.5113	0.2094	+47	−31
ν Libræ	5.3	0.82	6.1	15 54.4	10 52.4	−10 56.2	+0.7091	0.5166	0.2004	+74	− 4
22 Libræ	6.5	0.81	6.1	16 8.0	10 58.2	−10 50.5	+0.9401	0.5168	0.2003	+74	+11
32 Libræ	5.9	0.78	5.9	16 24.1	21 47.2	− 0 21.1	−0.8658	0.5237	0.1874	−12	−90
34 Libræ	6.0	+0.78	− 5.9	−16 18.0	22 59.4	+ 0 48.8	−1.2018	0.5246	−0.1858	−38	−90
ζ Libræ	5.6	0.77	5.8	16 32.8	**10** 0 6.2	+ 1 53.5	−1.1369	0.5254	−0.1844	−32	−90
				NEW	*MOON.*						
χ Sagittarii	4.9	1.02	1.5	24 41.2	**14** 6 36.6	+ 4 48.8	−1.0084	0.5758	+0.0384	−39	−90
51 Sagittarii	5.8	+1.05	− 1.3	−24 55.1	11 3.5	+ 9 5.7	−0.5648	0.5755	+0.0501	−11	−82
h Sagittarii	4.7	1.06	1.3	25 5.1	11 20.0	+ 9 21.6	−0.3756	0.5756	0.0508	− 1	−66
308 B. Sagittarii	6.3	1.09	− 1.1	24 10.1	18 38.8	− 7 36.1	−0.8974	0.5748	0.0699	−28	−90
36 B. Capricorni	6.2	1.21	+ 0.6	22 41.6	**15** 9 21.1	+ 6 33.2	−1.1354	0.5714	0.1069	−42	−90
56 B. Capricorni	6.3	1.30	1.0	24 6.4	13 48.0	+10 50.3	+0.8403	0.5699	0.1175	+66	+ 7
17 Capricorni	5.8	+1.27	+ 1.2	−21 50.7	16 22.4	−10 41.0	−1.2098	0.5690	+0.1236	−48	−90
χ Capricorni	5.3	1.36	1.9	21 33.5	**16** 1 54.2	− 1 30.1	−0.2236	0.5653	0.1451	+16	−55
27 Capricorni	6.1	1.36	2.0	20 55.3	2 19.8	− 1 5.4	−0.8243	0.5652	0.1461	−16	−90
φ Capricorni	5.3	1.38	2.3	21 1.8	4 56.6	+ 1 25.7	−0.3230	0.5640	0.1517	+12	−61
33 Capricorni	5.3	1.41	2.4	21 14.3	8 37.2	+ 4 58.4	+0.4657	0.5624	0.1593	+55	−16
35 Capricorni	6.0	+1.43	+ 2.4	−21 35.4	9 57.2	+ 6 15.5	+1.0447	0.5619	+0.1621	+68	+20
128 B. Capricorni	6.5	1.43	3.1	19 32.7	11 9.7	+ 7 25.4	−0.8794	0.5614	0.1645	−17	−90
37 Capricorni	5.7	1.45	3.0	20 29.4	13 16.0	+ 9 27.2	+0.4511	0.5604	0.1687	+55	−17
ε Capricorni	4.7	1.46	3.2	19 52.4	14 14.5	+10 23.6	−0.0220	0.5601	0.1706	+30	−43
κ Capricorni	4.8	1.49	3.5	19 16.8	16 40.7	−11 15.4	−0.2142	0.5589	0.1754	+20	−54
143 B. Capricorni	6.1	+1.50	+ 3.3	−20 2.2	16 55.4	−11 1.2	+0.6105	0.5588	+0.1758	+66	− 8
154 B. Capricorni	6.1	1.53	3.8	19 2.8	20 38.9	− 7 25.6	+0.2544	0.5571	0.1827	+46	−28
161 B. Capricorni	6.4	1.56	4.3	18 20.4	**17** 1 17.7	− 2 56.6	+0.3926	0.5550	0.1910	+55	−20
29 Aquarii (*mean*)	6.5	1.56	4.7	17 24.1	1 25.0	− 1 49.6	−0.5521	0.5549	0.1913	+ 4	−78
56 Aquarii	6.1	1.67	6.2	15 3.0	13 54.1	+ 9 13.7	−0.4580	0.5495	0.2113	+12	−70
69 Aquarii	5.6	+1.74	+ 6.8	−14 32.1	21 49.3	− 7 7.3	+0.7305	0.5464	+0.2222	+75	− 2
τ Aquarii	4.4	1.75	7.0	14 4.3	22 41.1	− 6 17.3	+0.4474	0.5461	0.2234	+62	−18
74 Aquarii	5.8	1.75	7.8	12 5.9	**18** 0 28.4	− 4 33.5	−1.1739	0.5454	0.2256	−31	−90
257 B. Aquarii	6.3	1.79	7.5	13 33.4	3 16.6	− 1 51.0	+0.9574	0.5444	0.2291	+76	+11
290 B. Aquarii	6.3	1.85	8.6	11 10.9	10 14.9	+ 4 53.3	+0.1497	0.5421	0.2368	+47	−33
ψ^1 Aquarii	4.5	+1.87	+ 9.1	− 9 34.9	10 48.1	+ 5 25.4	−1.3543	0.5420	+0.2373	−51	−90
ψ^2 Aquarii	4.6	1.86	9.2	9 40.6	11 45.1	+ 6 20.5	−1.0303	0.5418	0.2383	−18	−90
ψ^3 Aquarii	5.2	1.87	9.0	10 6.4	12 14.4	+ 6 48.8	−0.4751	0.5416	0.2388	+14	−71
336 B. Aquarii	6.3	1.91	9.4	9 45.8	16 55.4	+11 20.6	+0.3050	0.5403	0.2432	+56	−26
351 B. Aquarii	6.5	1.94	10.2	7 57.9	19 58.3	− 9 42.6	−0.7845	0.5396	0.2458	− 2	−90
376 B. Aquarii	6.3	+2.00	+10.7	− 6 53.0	**19** 2 4.0	− 3 49.0	−0.3735	0.5384	+0.2504	+21	−64

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

DECEMBER.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1909.0.		Apparent Declination.	Washington Mean Time.	Hour Angle, *H*	*Y*	*x'*	*y'*	N.	S.
		Δα	Δδ								
		s	"	° ′	d h m	h m				°	°
30 Piscium	4.7	+2.07	+11.0	− 6 31.0	**19** 8 22.4	+ 2 17.1	+0.8465	0.5376	+0.2544	+83	+ 3
33 Piscium	4.7	2.08	11.3	6 12.8	9 58.0	+ 3 49.5	+0.9436	0.5375	0.2553	+84	+ 9
24 B. Ceti	6.0	2.11	11.4	5 45.0	12 18.6	+ 6 5.5	+1.0727	0.5373	0.2564	+84	+18
54 B. Ceti	6.3	2.17	12.6	2 43.1	18 59.8	−11 26.4	−0.2805	0.5370	0.2590	+27	−58
14 Ceti	5.4	2.24	13.2	− 1 0.1	**20** 0 11.7	− 6 24.6	−0.6694	0.5373	0.2604	+ 6	−87
26 Ceti	6.0	+2.40	+14.0	+ 0 53.0	13 28.5	+ 6 26.1	+0.8921	0.5389	+0.2611	+90	+ 6
33 Ceti	6.1	2.42	14.3	1 57.9	16 37.8	+ 9 29.2	+0.6219	0.5396	0.2607	+82	− 9
f Piscium	5.1	2.46	14.7	3 8.4	20 0.2	−11 15.0	+0.3152	0.5404	0.2600	+60	−25
μ Piscium	5.0	2.56	15.4	5 40.8	**21** 1 43.4	− 5 43.3	−0.7635	0.5421	0.2582	+ 2	−84
ν Piscium	4.6	2.60	15.1	5 1.9	6 55.8	− 0 41.3	+1.2283	0.5439	0.2559	+90	+32
ξ Arietis	5.5	+2.88	+15.6	+10 12.2	**22** 2 32.7	− 5 44.5	+0.9111	0.5527	+0.2410	+90	+11
31 Arietis	5.7	2.98	15.7	12 3.5	7 45.3	− 0 42.7	+0.2876	0.5555	0.2354	+58	−23
38 Arietis	5.2	3.01	15.4	12 4.1	11 25.4	+ 2 49.7	+1.1329	0.5577	0.2310	+90	+28
σ Arietis	5.5	3 07	15.8	14 42.7	14 15.1	+ 5 33.3	−0.8764	0.5594	0.2273	− 6	−75
145 B. Arietis	6.5	3.15	15.3	15 30.4	19 57.2	+11 3.2	−0.4023	0.5627	0.2194	+20	−58
26 B. Tauri	6.4	+3.34	+14.1	+17 32.3	**23** 8 26.1	− 0 55.1	+0.1700	0.5706	+0.1988	+51	−24
13 Tauri	5.6	3.40	14.3	19 24.8	11 49.8	+ 2 21.0	−1.0515	0.5727	0.1926	−20	−71
14 Tauri	6.2	3.42	14.1	19 22.9	12 26.2	+ 2 56.0	−0.9033	0.5731	0.1914	− 9	−71
43 Tauri	5.5	3.54	12.4	19 22.4	22 52.4	−11 1.3	+0.9949	0.5793	0.1700	+90	+25
ω Tauri	4.8	3.58	12.0	20 21.5	**24** 2 9.0	− 7 52.3	+0.5470	0.5812	0.1628	+79	− 1
51 Tauri	5.6	+3.62	+12.1	+21 21.6	2 35.0	− 7 27.4	−0.3927	0.5815	+0.1618	+19	−51
53 Tauri	5.3	3.61	12.0	20 55.6	3 1.0	− 7 2.3	+0.1153	0.5817	0.1608	+48	−23
56 Tauri	5.2	3.62	12.0	21 33.5	3 4.8	− 6 58.7	−0.5113	0.5817	0.1606	+14	−58
224 B. Tauri	6.1	3.61	11.7	20 36.6	4 12.6	− 5 53.5	+0.6243	0.5824	0.1581	+87	+ 4
227 B. Tauri	5.9	3.62	11.6	20 46.4	4 40.5	− 5 26.6	+0.5325	0.5826	0.1570	+77	− 1
κ Tauri	4.1	+3.66	+11.7	+22 5.4	5 23.2	− 4 45.6	−0.6831	0.5830	+0.1553	+ 4	−67
67 Tauri	5.4	3.66	11.7	21 59.7	5 24.5	− 4 44.4	−0.5853	0.5830	0.1553	+ 9	−61
υ' Tauri	4.2	3.68	11.7	22 36.7	5 45.4	− 4 24.3	−1.1519	0.5832	0.1545	−30	−67
72 Tauri	5.4	3.68	11.7	22 47.7	6 9.2	− 4 1.4	−1.2766	0.5834	0.1536	−47	−67
247 B. Tauri	5.8	3.66	11.4	21 25.2	6 27.6	− 3 43.7	+0.1570	0.5835	0.1529	+51	−20
284 B. Tauri	6.0	+3.74	+10.9	+23 9.5	9 49.5	− 0 29.7	−1.0964	0.5853	+0.1448	−25	−67
τ Tauri	4.5	3 74	10.5	22 47.2	12 7.7	+ 1 43.2	−0.3933	0.5864	0.1392	+20	−48
300 B. Tauri	6.2	3.77	10.3	23 27.9	13 29.6	+ 3 1.8	−0.8916	0.5870	0.1357	−10	−67
99 Tauri	6.0	3.82	9.3	23 48.6	18 16.4	+ 7 37.3	−0.6212	0.5892	0.1236	+ 7	−61
103 Tauri	5.5	3.86	8.5	24 8.9	22 19.0	+11 30.4	−0.4859	0.5907	0.1129	+15	−52
118 Tauri	5.4	+3.94	+ 6.6	+25 4.8	**25** 6 33.9	− 4 34.4	−0.5921	0.5933	+0.0904	+ 8	−57
121 Tauri	5.1	3.93	6.0	23 58.9	8 59.0	− 2 15.2	+0.7331	0.5939	0.0836	+90	+17
125 Tauri	5.1	3.99	5.7	25 50.9	10 37.0	− 0 41.2	−1.0312	0.5941	0.0790	−22	−64
132 Tauri	5.0	3.97	4.8	24 32.3	14 14.1	+ 2 47.2	+0.5674	0.5947	0.0687	+82	+ 9
412 B. Tauri	5.8	3.97	4.0	24 14.3	17 18.4	+ 5 44.1	+1.0723	0.5951	0.0598	+90	+42
139 Tauri	4.7	+4.03	+ 4.0	+25 56.7	17 41.2	+ 6 6.0	−0.6437	0.5951	+0.0588	+ 5	−58
5 Geminorum	5.9	4.00	2.6	24 26.5	22 57.2	+11 9.3	+1.1587	0.5953	0.0434	+90	+51
52 B. Geminorum	6.5	4.02	+ 0.1	24 40.0	**26** 8 59.5	− 3 12.7	+1.2219	0.5941	0.0141	+90	+59
ε Geminorum	3.2	4.04	− 0.6	25 13.3	11 30.1	− 0 48.2	+0.6798	0.5936	+0.0067	+90	+21
37 Geminorum	5.7	4.04	1.7	25 29.4	15 56.2	+ 3 27.2	+0.4069	0.5924	−0.0061	+68	+ 6
39 Geminorum	6.2	+4.05	− 2.0	+26 12.0	17 17.5	+ 4 45.2	−0.3355	0.5921	−0.0101	+23	−34
40 Geminorum	6.3	4.05	2.1	26 2.3	17 33.1	+ 5 0.3	−0.1706	0.5919	0.0108	+32	−24
47 Geminorum	5.6	4.08	3.4	27 0.3	22 13.1	+ 9 29.1	−1.2512	0.5900	0.0241	−51	−63
52 Geminorum	6.1	4.01	3.7	25 2.6	23 33.3	+10 46.2	+0.7395	0.5895	0.0279	+90	+23
134 B. Geminorum	6.5	4.07	4.1	26 51.2	**27** 0 27.4	+11 38.2	−1.1560	0.5891	0.0305	−35	−63
A Geminorum	5.1	+4.00	− 4.5	+25 13.5	3 1.8	− 9 53.5	+0.4383	0.5879	−0.0377	+71	+ 5
176 B. Geminorum	6.3	3.96	5.9	24 33.8	8 55.8	− 4 13.3	+0.8555	0.5848	0.0539	+90	+27
181 B. Geminorum	6.0	3.96	6.0	24 25.7	9 19.1	− 3 51.0	+0.9750	0.5845	0.0549	+90	+35
κ Geminorum	3.6	3.95	6.5	24 36.9	11 25.7	− 1 49.2	+0.6594	0.5833	0.0606	+90	+15
ω^1 Cancri	6.0	3.94	8.1	25 38.4	18 6.4	+ 4 36.1	−0.8710	0.5789	0.0780	−10	−64
5 B. Cancri	6.4	+3.89	− 8.0	+23 49.9	18 10.1	+ 4 39.7	+1.0091	0.5789	−0.0782	+90	+35

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

DECEMBER.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1909.0.		Apparent Declination.	Washington Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
		Δα	Δδ								
		s	"	° ′	d h m	h m				°	°
4 Cancri	6.2	+3.93	− 8.2	+25 20.3	**27** 18 26.4	+ 4 55.3	−0.5825	0.5788	−0.0789	+ 9	−56
35 B. Cancri	6.4	3.84	9.1	23 24.6	23 24.0	+ 9 41.6	+1.0088	0.5751	0.0913	+90	+34
λ Cancri	5.9	3.84	9.8	24 18.4	**28** 2 13.9	−11 34.8	−0.1972	0.5731	0.0981	+31	−34
28 Cancri	6.1	3.82	10.6	24 26.7	5 37.2	− 8 19.1	−0.6884	0.5705	0.1061	+ 3	−64
υ^1 Cancri	5.7	3.80	10.9	24 23.1	6 50.8	− 7 8.2	−0.7590	0.5694	0.1090	− 2	−66
υ^2 Cancri	6.4	+3.80	−11.0	+24 23.5	7 28.6	− 6 31.8	−0.8351	0.5689	−0.1104	− 7	−66
ξ Cancri	5.2	3.61	13.7	22 24.6	23 15.6	+ 8 41.3	−0.7663	0.5555	0.1437	− 2	−68
79 Cancri	6.1	3.60	13.7	22 21.8	23 42.0	+ 9 6.8	−0.7793	0.5551	0.1446	− 2	−68
90 H.′ Cancri	6.1	3.57	13.7	21 39.3	**29** 1 10.0	+10 31.7	−0.2442	0.5539	0.1474	+28	−41
57 B. Leonis	6.5	3.37	15.7	19 16.7	15 16.9	+ 0 9.9	+0.0245	0.5416	0.1720	+43	−30
η Leonis	3.6	+3.21	−16.5	+17 12.1	**30** 2 7.7	+10 39.7	+0.2954	0.5323	−0.1878	+59	−18
42 Leonis	6.1	3.10	16.9	15 25.8	9 12.8	− 6 28.7	+0.8414	0.5266	0.1967	+90	+10
46 Leonis	5.8	3.03	17.2	14 36.0	14 21.4	− 1 29.6	+0.7117	0.5226	0.2026	+90	+ 2
k Leonis	5.5	2.95	18.0	14 40.2	21 32.3	+ 5 28.1	−0.8470	0.5174	0.2100	− 5	−75
ι Leonis	4.1	+2.71	−18.4	+11 1.5	**31** 17 6.4	+ 0 27.9	−1.1579	0.5052	−0.2253	−25	−79

OCCULTATIONS VISIBLE AT WASHINGTON DURING THE YEAR 1909.

Date.	The Star's		IMMERSION.				EMERSION.				Duration of Occultation.
			Washington.		Angle from—		Washington.		Angle from—		
	Name.	Mag.	Sidereal Time.	Mean Time.	North Point.	Vertex.	Sidereal Time.	Mean Time.	North Point.	Vertex.	
			h m	h m	°	°	h m	h m	°	°	h m
Jan. 2	148 B. Tauri	5.9	22 57	4 9	341	36	23 2	4 15	330	25	0 6
2	163 B. Tauri	5.8	3 18	8 30	4	24	4 1	9 12	303	301	0 42
3	ι Tauri	4.7	7 33	12 40	82	27	8 49	13 56	263	206	1 16
3	105 Tauri	6.0	10 8	15 15	80	24	11 8	16 15	273	219	1 0
4	175 H′. Tauri	6.5	22 23	3 27	54	103	23 11	4 16	278	330	0 49
4	1 Geminorum	4.1	10 30	15 33	123	65	11 25	16 28	242	186	0 55
4	3 Geminorum ‡	5.6	13 6	18 9	146	98	13 37	18 39	219	173	0 30
6	82 Geminorum	6.3	6 34	11 30	149	189	7 29	12 24	223	233	0 54
7	γ Cancri	4.9	7 11	12 2	99	143	8 42	13 34	290	288	1 32
9	42 Leonis	6.1	6 59	11 42	125	177	8 20	13 4	278	321	1 22
25	24 B. Ceti	6.0	0 10	3 52	77	76	1 20	5 2	213	193	1 10
27	39 B. Arietis	6.5	6 18	9 51	109	58	7 4	10 37	204	152	0 46
29	33 B. Tauri	6.3	0 17	3 44	339	31	0 25	3 52	325	17	0 8
30	282 B. Tauri	6.4	0 59	4 21	114	169	1 48	5 10	198	251	0 49
31	394 B. Tauri	6.0	9 7	12 24	56	357	10 6	13 23	304	246	0 59
Feb. 2	187 B. Geminorum ‡	6.3	13 24	16 32	137	82	14 11	17 19	248	197	0 47
7	ν Virginis	4.2	15 12	18 0	58	10	15 44	18 32	3	314	0 32
10	88 Virginis	6.5	8 10	10 47	116	167	9 13	11 51	301	349	1 4
10	598 B. Virginis	6.1	13 21	15 58	148	156	14 42	17 19	284	270	1 21
12	32 Libræ	5.9	12 21	14 50	118	155	13 39	16 8	303	327	1 18
13	58 G. Scorpii	6.2	12 0	14 25	98	143	13 6	15 31	313	350	1 6
15	70 B. Sagittarii	6.4	16 17	18 34	66	91	17 25	19 41	312	324	1 7
23	ν Piscium	4.6	5 10	6 58	92	44	6 6	7 53	215	1[illegible]4	0 55
25	33 B. Tauri *	6.3	10 25	12 3	122	72	11 2	12 40	215	168	0 37
27	108 Tauri	6.2	2 15	3 46	71	127	3 34	5 5	249	296	1 19

Note.—The angles of position are counted from the north point and vertex of the Moon's limb, toward the east.

* Whole occultation below the horizon of Washington. ‡ Emersion below the horizon of Washington.

OCCULTATIONS VISIBLE AT WASHINGTON DURING THE YEAR 1909.

Date.		The Star's				IMMERSION.				EMERSION.				Duration of Occultation.
		Name.			Mag.	Washington.		Angle from—		Washington.		Angle from—		
						Sidereal Time.	Mean Time.	North Point.	Vertex.	Sidereal Time.	Mean Time.	North Point.	Vertex.	
						h m	h m	°	°	h m	h m	°	°	h m
Feb.	28	8		Geminorum	6.1	5 30	6 57	94	123	7 0	8 27	254	221	1 30
Mar.	1	48		Geminorum	5.8	6 7	7 30	90	129	7 40	9 3	274	250	1 33
	5	46		Leonis	5.8	4 52	6 0	70	121	5 42	6 50	319	12	0 50
	12	β^1		Scorpii	2.9	15 40	16 19	76	80	16 50	17 29	332	321	1 10
	12	56	B.	Scorpii	5.0	15 41	16 20	74	78	16 50	17 28	334	322	1 8
	14	63		Ophiuchi	6.1	15 28	15 59	118	147	16 47	17 17	270	284	1 18
	28	ω		Geminorum	5.2	11 26	11 2	101	42	12 29	12 5	280	224	1 3
	30	γ		Cancri	4.9	8 8	7 37	183	202	8 29	7 58	209	215	0 21
Apr.	1	42		Leonis	6.1	7 57	7 18	133	179	9 22	8 43	278	304	1 25
	3	ν		Virginis *	4.2	4 42	3 56	158	208	5 20	4 34	241	292	0 38
	6	95		Virginis	5.4	10 18	9 19	125	169	11 32	10 33	302	336	1 14
	6	κ		Virginis	4.2	15 15	14 15	105	88	16 36	15 36	318	285	1 21
	8	47		Libræ	5.8	19 38	18 29	74	32	20 39	19 31	312	264	1 2
	9	ω		Ophiuchi	4.5	10 22	9 12	122	176	11 19	10 8	281	331	0 56
	14	37		Capricorni	5.7	17 4	15 32	94	140	18 10	16 38	241	280	1 6
	24	52	B.	Geminorum	6.5	10 33	8 24	82	22	11 36	9 27	293	235	1 3
	30	ν		Virginis	4.2	15 37	13 3	71	21	16 21	13 46	349	298	0 43
May	3	598	B.	Virginis	6.1	13 21	10 36	72	79	14 12	11 26	1	355	0 50
	4	6	B.	Libræ	6.2	10 20	7 31	95	141	11 24	8 34	329	7	1 3
	4	μ		Libræ ‡	5.4	19 29	16 38	120	72	20 32	17 42	277	225	1 4
	7	39		Ophiuchi	5.1	15 22	12 20	163	186	16 11	13 9	236	249	0 49
	7	191	B.	Ophiuchi	6.3	19 36	16 34	55	27	20 36	17 34	315	278	1 0
	7	b		Ophiuchi	4.4	20 44	17 41	13	335	20 56	17 53	354	314	0 12
	8	67	B.	Sagittarii	6.4	16 55	13 49	80	96	18 17	15 11	296	295	1 22
	14	33		Piscium	4.7	20 2	16 32	354	40	20 26	16 56	311	354	0 24
	21	5		Geminorum	5.9	11 22	7 26	66	10	12 13	8 17	301	247	0 51
	21	8		Geminorum ‡	6.1	13 34	9 37	166	119	13 48	9 52	200	155	0 15
	22	48		Geminorum	5.8	12 57	8 57	183	128	13 5	9 5	198	144	0 8
	31	4	G.	Libræ	6.5	15 11	10 35	151	138	16 27	11 51	275	245	1 16
June	2	ω^1		Scorpii	4.3	17 48	13 4	170	147	18 30	13 45	229	198	0 41
	3	24		Ophiuchi	5.5	14 18	9 30	113	144	15 37	10 49	292	308	1 19
	8	161	B.	Capricorni	6.4	21 20	16 11	11	20	22 9	17 0	296	294	0 49
	13	25		Arietis	6.5	20 58	15 30	47	99	21 53	16 25	257	309	0 55
	20	γ		Cancri	4.9	14 50	8 56	136	84	15 37	9 43	259	210	0 47
	22	42		Leonis	6.1	13 42	7 40	114	62	14 50	8 48	304	250	1 8
	26	65		Virginis	6.0	16 51	10 33	124	81	18 3	11 45	292	243	1 12
	26	66		Virginis	5.7	17 49	11 31	141	92	18 50	12 32	272	220	1 1
	27	623	B.	Virginis	6.5	13 53	7 32	110	111	15 18	8 56	321	300	1 24
July	1	191	B.	Ophiuchi †	6.3	12 16	5 38	136	185	13 10	6 33	262	306	0 55
	1	b		Ophiuchi †	4.4	12 42	6 4	100	147	13 46	7 8	299	339	1 4
	2	λ		Sagittarii	2.9	14 6	7 25	44	88	14 42	8 0	340	21	0 35
	5	37		Capricorni †	5.7	16 28	9 34	65	114	17 30	10 36	273	316	1 2
	5	143	B.	Capricorni	6.1	20 59	14 4	86	95	22 13	15 18	224	216	1 14
	10	64		Ceti	5.8	21 13	13 59	55	107	22 14	15 0	245	296	1 1
	10	ξ^1		Ceti	4.5	22 10	14 55	47	97	23 14	16 0	250	295	1 5
	12	163	B.	Tauri	5.8	22 15	14 52	125	179	22 44	15 22	187	241	0 30
	27	84	B.	Scorpii	6.3	18 18	9 58	114	86	19 38	11 17	276	237	1 19
	27	51	G.	Scorpii	6.5	19 55	11 34	126	85	21 0	12 38	255	207	1 4
Aug.	4	30		Piscium †	4.7	17 44	8 52	31	83	18 28	9 36	284	335	0 44
	4	33		Piscium	4.7	19 12	10 20	45	93	20 12	11 20	262	307	1 0

NOTE.—The angles of position are counted from the north point and vertex of the Moon's limb, toward the east.
* Whole occultation below the horizon of Washington. † Immersion below the horizon of Washington.
‡ Emersion below the horizon of Washington.

OCCULTATIONS VISIBLE AT WASHINGTON DURING THE YEAR 1909.

Date.	The Star's		Immersion.				Emersion.				Duration of Occultation.
			Washington.		Angle from—		Washington.		Angle from—		
	Name.	Mag.	Sidereal Time.	Mean Time.	North Point	Vertex.	Sidereal Time.	Mean Time.	North Point.	Vertex.	
			h m	h m	°	°	h m	h m	°	°	h m
Aug. 4	24 B. Ceti	6.0	21 52	12 59	86	118	22 56	14 3	206	224	1 4
5	26 Ceti	6.0	22 26	13 30	20	58	23 24	14 28	271	299	0 58
5	33 Ceti	6.1	2 53	17 55	47	16	4 4	19 6	246	204	1 11
9	129 H′. Tauri	5.8	21 42	12 30	123	173	22 14	13 2	198	250	0 32
11	52 B. Geminorum	6.5	23 54	14 34	71	122	0 49	15 28	270	325	0 54
20	*l* Virginis	4.8	16 40	6 45	118	76	17 55	8 0	300	252	1 15
22	ν Libræ ‡	5.3	20 14	10 11	160	110	20 52	10 49	232	180	0 38
29	143 B. Capricorni	6.1	18 32	8 2	83	120	19 44	9 14	240	264	1 12
29	154 B. Capricorni	6.1	23 38	13 7	61	37	0 47	14 16	242	206	1 9
30	69 Aquarii	5.6	21 42	11 7	91	106	22 46	12 11	206	206	1 4
30	τ Aquarii	4.4	23 2	12 27	58	53	0 15	13 40	237	216	1 13
Sept. 1	Mars	. .	19 24	8 42	76	126	20 21	9 39	229	276	0 57
3	ξ Arietis	5.5	20 18	9 28	343	35	20 26	9 36	326	17	0 8
9	35 B. Cancri †	6.4	0 46	13 31	102	149	1 39	14 24	260	311	0 53
21	θ Ophiuchi ‡	3.3	21 9	9 8	143	101	21 53	9 52	220	173	0 44
25	33 Capricorni	5.3	1 11	12 54	120	77	1 46	13 28	190	144	0 34
28	33 Piscium	4.7	18 39	6 11	73	123	19 37	7 9	236	283	0 58
28	24 B. Ceti	6.0	21 15	8 47	113	151	21 55	9 26	181	212	0 39
29	26 Ceti	6.0	20 14	7 41	51	101	21 13	8 40	249	295	0 59
29	33 Ceti	6.1	0 8	11 35	54	73	1 21	12 48	232	227	1 13
29	*f* Piscium	5.1	4 41	16 7	70	24	5 42	17 8	232	182	1 1
Oct. 4	412 B. Tauri	5.8	22 41	9 48	114	162	23 22	10 29	220	272	0 41
9	46 Leonis *	5.8	3 5	13 52	152	199	3 43	14 30	237	287	0 38
20	σ Sagittarii	2.3	20 56	7 1	40	14	21 55	8 0	303	268	0 59
23	143 B. Capricorni	6.1	17 43	3 37	15	58	18 18	4 12	315	353	0 35
24	69 Aquarii	5.6	22 19	8 8	60	65	23 37	9 25	234	222	1 17
24	τ Aquarii	4.4	23 52	9 41	30	14	0 58	10 47	262	233	1 6
28	ξ Arietis	5.5	20 8	5 42	51	103	21 0	6 33	255	307	0 51
28	31 Arietis	5.7	2 38	12 11	33	30	3 46	13 19	262	233	1 8
31	121 Tauri	5.1	1 1	10 22	116	174	1 48	11 9	209	268	0 47
31	132 Tauri	5.0	8 45	18 5	156	98	9 14	18 33	203	144	0 28
Nov. 19	35 Capricorni	6.0	19 12	3 19	89	116	20 31	4 38	232	243	1 19
19	37 Capricorni	5.7	0 30	8 36	33	357	1 29	9 35	272	229	0 59
21	336 B. Aquarii ‡	6.3	3 59	11 57	53	5	4 56	12 54	248	197	0 57
22	24 B. Ceti	6.0	20 20	4 15	73	118	21 27	5 22	225	262	1 7
23	26 Ceti	6.0	20 54	4 45	43	91	21 56	5 47	253	296	1 2
23	33 Ceti	6.1	1 8	8 58	61	61	2 22	10 12	224	201	1 14
23	*f* Piscium	5.1	5 41	13 31	68	18	6 40	14 29	238	186	0 58
26	ω Tauri	4.8	9 42	17 19	120	65	10 25	18 2	222	170	0 43
29	*A* Geminorum	5.1	9 46	17 12	126	69	10 53	18 18	259	199	1 6
Dec. 2	η Leonis	3.6	8 52	16 5	129	161	10 19	17 33	288	280	1 28
22	31 Arietis	5.7	1 22	7 18	3	30	2 8	8 4	288	298	0 46
23	26 B. Tauri	6.4	2 16	8 8	345	18	2 35	8 27	315	341	0 19
24	224 B. Tauri †	6.1	21 2	2 51	12	60	21 26	3 16	309	359	0 25
25	132 Tauri	5.0	9 23	15 7	154	95	9 53	15 36	207	148	0 29
26	37 Geminorum	5.7	11 0	16 40	89	29	12 1	17 40	290	233	1 0

NOTE.—The angles of position are counted from the north point and vertex of the Moon's limb, toward the east.
* Whole occultation below the horizon of Washington. † Immersion below the horizon of Washington.
‡ Emersion below the horizon of Washington.

FOR WASHINGTON MEAN NOON.

Date.	*k*	*i*	*θ*	*L*	Date.	*k*	*i*	*θ*	*L*
		°	°				°	°	
Jan. 1	0.988	12	15	28.9	July 5	0.300	113	168	33.6
6	0.969	20	9	33.5	10	0.435	97	173	44.3
11	0.931	30	357	40.4	15	0.583	80	179	54.9
16	0.861	43	351	49.6	20	0.742	60	184	64.4
21	0.746	60	345	61.2	25	0.884	39	192	68.7
26	0.565	82	341	66.6	30	0.972	19	202	62.3
31	0.331	110	336	55.5	Aug. 4	0.998	5	295	55.5
Feb. 5	0.109	141	327	23.4	9	0.979	16	1	45.8
10	0.011	168	279	2.5	14	0.942	28	12	38.7
15	0.052	154	185	10.4	19	0.899	38	18	33.7
20	0.175	130	172	26.8	24	0.850	46	21	30.8
25	0.315	112	168	35.2	29	0.803	53	23	29.3
Mar. 2	0.425	99	164	35.6	Sept. 3	0.754	60	25	29.0
7	0.523	87	161	34.4	8	0.699	67	26	29.7
12	0.602	78	158	32.5	13	0.638	74	27	31.4
17	0.664	71	156	31.1	18	0.561	83	28	35.7
22	0.724	63	153	30.6	23	0.458	94	29	36.0
27	0.777	56	151	27.9	28	0.340	109	30	31.7
Apr. 1	0.828	48	150	33.1	Oct. 3	0.194	129	33	27.8
6	0.881	40	149	36.6	8	0.054	152	40	9.4
11	0.933	30	147	42.2	13	0.005	172	179	1.1
16	0.977	17	145	50.2	18	0.114	140	204	33.8
21	1.000	2	97	60.1	23	0.341	107	208	55.9
26	0.974	18	338	67.5	28	0.576	80	209	64.4
May 1	0.886	39	339	68.9	Nov. 2	0.751	59	209	56.2
6	0.751	60	341	62.3	7	0.862	42	208	50.9
11	0.602	78	344	52.8	12	0.926	32	205	37.5
16	0.463	94	348	43.4	17	0.963	22	200	31.6
21	0.343	108	351	35.7	22	0.986	14	195	27.8
26	0.237	122	354	27.8	27	0.996	7	186	25.4
31	0.142	136	358	19.1	Dec. 2	1.000	2	117	24.4
June 5	0.061	151	3	9.3	7	0.997	6	32	24.5
10	0.017	165	19	2.8	12	0.989	12	20	25.2
15	0.005	172	104	0.8	17	0.974	19	12	28.1
20	0.034	159	149	5.5	22	0.947	27	6	32.2
25	0.099	143	158	14.3	27	0.906	36	0	39.6
30	0.191	128	163	24.4	32	0.836	49	355	47.3

NOTATION.

k=the ratio of the area of the illuminated portion of the apparent disk to the area of the entire apparent disk regarded as circular.

i=the angle between the Sun and Earth, as seen from the planet.

θ=the angle which the line joining the cusps, or extremities of the illuminated portion, makes with the meridian.

L=the brilliancy of the disk. The unit of L is the amount of light received by an eye from a circular disk with the same albedo as the planet, subtending an angular radius of one second of arc, situated at distance unity from the Sun, and illuminated by the latter as the mean disk of the planet is illuminated.

FOR WASHINGTON MEAN NOON.

Date.	*k*	*i*	*θ*	*L*	Date.	*k*	*i*	*θ*	*L*
		°	°				°	°	
Jan. 1	0.880	40.4	189.7	61.8	July 5	0.948	26.4	8.4	51.7
6	0.890	38.6	186.9	60.2	10	0.940	28.4	10.7	52.5
11	0.900	36.8	183.9	58.7	15	0.931	30.4	12.7	53.4
16	0.909	35.1	180.8	57.3	20	0.922	32.4	14.6	54.3
21	0.918	33.3	177.7	56.1	25	0.913	34.4	16.3	55.3
26	0.925	31.6	174.6	55.1	30	0.903	36.4	17.6	56.3
31	0.933	29.9	171.5	54.1	Aug. 4	0.892	38.4	19.0	57.5
Feb. 5	0.940	28.2	168.4	53.1	9	0.881	40.4	20.1	58.7
10	0.947	26.5	165.5	52.2	14	0.870	42.4	21.0	60.2
15	0.953	24.9	162.7	51.4	19	0.858	44.4	21.6	61.7
20	0.959	23.2	160.1	50.7	24	0.846	46.3	22.0	63.3
25	0.965	21.6	157.6	50.0	29	0.832	48.2	22.3	65.0
Mar. 2	0.970	19.9	155.3	49.4	Sept. 3	0.819	50.2	22.2	66.9
7	0.974	18.2	153.3	48.9	8	0.806	52.2	22.0	69.0
12	0.979	16.6	151.5	48.4	13	0.793	54.1	21.5	71.2
17	0.983	14.9	149.7	48.0	18	0.779	56.1	20.8	73.7
22	0.986	13.2	148.1	47.6	23	0.765	58.0	20.0	76.4
27	0.990	11.5	146.6	47.3	28	0.750	60.0	18.8	79.3
Apr. 1	0.993	9.8	145.2	47.0	Oct. 3	0.735	62.0	17.3	82.4
6	0.995	8.1	143.5	46.8	8	0.719	64.0	15.7	85.9
11	0.996	6.4	141.1	46.7	13	0.703	66.0	13.9	89.7
16	0.999	4.6	137.6	46.6	18	0.686	68.1	11.9	93.9
21	0.999	3.0	129.0	46.6	23	0.668	70.3	9.8	98.4
26	1.000	1.4	102.5	46.6	28	0.651	72.4	7.5	103.5
May 1	1.000	1.4	29.6	46.6	Nov. 2	0.633	74.6	5.1	109.1
6	0.999	3.1	0.3	46.7	7	0.614	76.9	2.7	115.1
11	0.998	4.9	352.7	46.9	12	0.593	79.2	0.3	121.7
16	0.997	6.7	350.5	47.1	17	0.572	81.5	357.9	128.9
21	0.995	8.6	350.2	47.3	22	0.550	84.3	355.5	136.8
26	0.992	10.6	351.1	47.6	27	0.527	87.0	353.3	145.6
31	0.988	12.5	352.5	47.9	Dec. 2	0.502	89.8	351.1	154.9
June 5	0.984	14.4	354.5	48.3	7	0.476	92.8	349.1	165.0
10	0.980	16.4	356.6	48.8	12	0.448	96.0	347.2	175.7
15	0.975	18.4	358.9	49.3	17	0.418	99.4	345.5	186.9
20	0.969	20.4	1.3	49.8	22	0.386	103.2	344.0	197.6
25	0.963	22.4	3.7	50.4	27	0.352	107.3	342.5	207.6
30	0.956	24.4	6.1	51.0	31	0.324	110.6	341.3	214.6

NOTATION.

k = the ratio of the area of the illuminated portion of the apparent disk to the area of the entire apparent disk regarded as circular.

i = the angle between the Sun and Earth, as seen from the planet.

θ = the angle which the line joining the cusps, or extremities of the illuminated portion, makes with the meridian.

L = the brilliancy of the disk. The unit of L is the amount of light received by an eye from a circular disk with the same albedo as the planet, subtending an angular radius of one second of arc, situated at distance unity from the Sun, and illuminated by the latter as the mean disk of the planet is illuminated.

FOR WASHINGTON MEAN NOON.

Date.	k	Date.	k	i	θ	L
				°	°	
Jan. 1	0.943	June 30	0.860	44.0	157.8	23.2
11	0.937	July 10	0.869	42.6	158.2	28.2
21	0.931	20	0.879	40.6	158.8	34.4
31	0.925	30	0.895	37.7	159.7	42.1
Feb. 10	0.918	Aug. 9	0.915	33.8	161.1	51.6
20	0.910	19	0.939	28.7	162.9	62.5
Mar. 2	0.901	29	0.962	22.3	165.9	73.8
12	0.893	Sept. 8	0.984	14.5	171.6	83.0
22	0.885	18	0.995	8.2	192.0	86.8
Apr. 1	0.878	28	0.998	5.1	296.1	83.0
11	0.872	Oct. 8	0.987	12.8	324.4	72.9
21	0.866	18	0.970	20.1	331.1	59.9
May 1	0.860	28	0.949	26.1	333.6	47.3
11	0.856	Nov. 7	0.929	31.0	335.0	36.6
21	0.853	17	0.911	34.5	335.7	28.2
31	0.852	27	0.899	37.0	336.2	21.9
June 10	0.852	Dec. 7	0.889	38.8	336.6	17.2
20	0.854	17	0.883	39.9	336.9	13.7
30	0.860	27	0.879	40.6	337.4	11.0

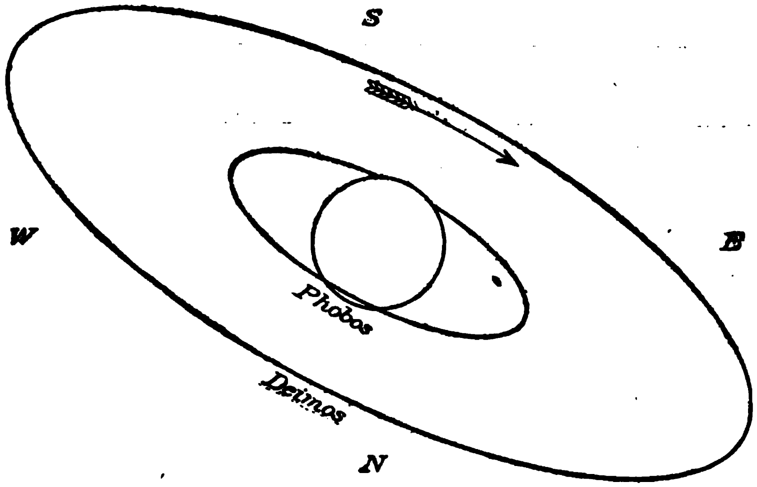
NOTATION.

k = the ratio of the area of the illuminated portion of the apparent disk to the area of the entire apparent disk regarded as circular.

i = the angle between the Sun and Earth, as seen from the planet.

θ = the angle which the line joining the cusps, or extremities of the illuminated portion, makes with the meridian.

L = the brilliancy of the disk. The unit of L is the amount of light received by an eye from a circular disk with the same albedo as the planet, subtending an angular radius of one second of arc, situated at distance unity from the Sun, and illuminated by the latter as the mean disk of the planet is illuminated.



APPARENT ORBITS OF THE SATELLITES OF MARS, AT DATE OF OPPOSITION, SEPTEMBER 23, 1909, AS SEEN IN AN INVERTING TELESCOPE.

The circle represents the planet and is on the same scale as the orbits.

WASHINGTON MEAN TIME OF GREATEST ELONGATIONS.

Phobos.						Deimos.			
	d h		d h		d h		d h		d h
Sept.	4 8.3 E.	Sept.	21 2.0 W.	Oct.	7 19.7 E.	Sept.	5 5.7 E.	Oct.	3 14.7 W.
	5 11.1 W.		22 4.8 E.		8 22.5 W.		7 3.1 W.		5 12.1 E.
	6 13.8 E.		23 7.6 W.		10 1.3 E.		9 0.5 E.		7 9.6 W.
	7 16.6 W.		24 10.3 E.		11 4.1 W.		10 21.9 W.		9 7.0 E.
	8 19.4 E.		25 13.1 W.		12 6.9 E.		12 19.3 E.		11 4.4 W.
	9 22.2 W.		26 15.9 E.		13 9.7 W.		14 16.7 W.		13 1.8 E.
	11 1.0 E.		27 18.7 W.		14 12.4 E.		16 14.1 E.		14 23.2 W.
	12 3.8 W.		28 21.5 E.		15 15.2 W.		18 11.5 W.		16 20.6 E.
	13 6.5 E.		30 0.3 W.		16 18.0 E.		20 8.9 E.		18 18.1 W.
	14 9.3 W.	Oct.	1 3.0 E.		17 20.8 W.		22 6.3 W.		20 15.5 E.
	15 12.1 E.		2 5.8 W.		18 23.6 E.		24 3.7 E.		22 13.0 W.
	16 14.9 W.		3 8.6 E.		20 2.4 W.		26 1.1 W.		24 10.4 E.
	17 17.6 E.		4 11.4 W.		21 5.2 E.		27 22.5 E.		26 7.9 W.
	18 20.4 W.		5 14.2 E.		22 8.0 W.		29 19.9 W.		28 5.3 E.
	19 23.2 E.		6 17.0 W.		23 10.7 E.	Oct.	1 17.3 E.		30 2.7 W.

Phobos.			Deimos.		
Date.	Position Angle.	Distance.	Date.	Position Angle.	Distance.
d	°	″	d	°	′ ″
Sept. 4	240.0	32.1	Sept. 4	240.0	1 20.5
24	242.3	33.0	24	242.3	1 23.0
Oct. 14	244.6	29.4	Oct. 14	244.6	1 14.0

For Phobos every seventh eastern and western elongation is given and for Deimos every third; the intermediate ones may be found by adding the periodic time of each satellite. Periodic time of Phobos. $7^h\ 39^m\ 13^s.85$ Periodic time of Deimos, $30^h\ 17^m\ 54^s.86$.

Jupiter is in opposition February 28, 1909, but at this date the Earth is very near the planes of the orbits of the satellites, and hence the apparent orbits approximate straight lines. For this reason the diagram of the apparent orbits is not given.

The ephemeris of the four outer satellites of Jupiter is given on pages 490–511, each month occupying two pages, which contain respectively the times of the phenomena and the diagrams of the configurations. The latter are given for each day, Jupiter being represented by a light disk, ○, in the center of the page, and the relative positions of the satellites at the Washington time stated above the diagrams being indicated by dots. The designation of each satellite is shown by a numeral placed to the right or left of the dot according as the motion of the satellite at the instant in question is toward the east or toward the west, the motion being always toward the numeral. In constructing the diagrams the latitudes of the satellites are always considered zero, except where two or more of them chance to be at nearly the same distance from the planet, when they are placed one above the other according to their apparent latitudes. If, at the epoch of any configuration, one or more satellites are projected on the disk of the planet, that phenomenon is indicated by a light disk, ○, at the left-hand side of the page; and if any satellites are invisible on account of being occulted behind the disk of the planet, or eclipsed by its shadow, that circumstance is indicated by a dark disk, ●, at the right-hand side of the page. In both cases the annexed numerals serve to point out which satellites are thus rendered invisible.

At any time near opposition, the approximate position angles and distances from Jupiter of the four outer satellites may be obtained by means of the following tables, using the interval of time before or after superior geocentric conjunction as argument.

SATELLITES OF JUPITER.

Satellite I. P=24°.5.		Satellite II. P=24°.5.		Satellite III. P=24°.5.		Satellite IV. P=24°.5.	
Arg.	s.	Arg.	s.	Arg.	s.	Arg.	s.
h	"	d h	"	d h	"	d	"
2	38	0 4	61	0 8	96	1	215
4	73	0 8	116	0 16	184	2	400
6	102	0 12	162	1 0	257	3	530
8	122	0 16	194	1 8	307	4	586
10	131	0 20	208	1 16	332	5	560
12	129	1 0	205	2 0	328	6	457
14	115	1 4	185	2 8	297	7	290
16	92	1 8	148	2 16	240	8	83
18	61	1 12	99	3 0	163	.	...
20	24	1 16	41	3 8	72	.	..

MEAN SYNODIC PERIODS OF THE SATELLITES.

	d h m s		d		d h m s		d
I.	1 18 28 35.945	=	1.769 860 48	III.	7 3 59 35.854	=	7.166 387 20
II.	3 13 17 53.735	=	3.554 094 16	IV.	16 18 5 6.928	=	16.753 552 41

d h m s d
V. 0 11 57 27.635 = 0.498 236 52

SATELLITE V.

WASHINGTON MEAN TIME OF EVERY TWENTIETH GREATEST ELONGATION.

	d	h			d	h			d	h			d	h	
Jan.	10	13.2	E.	Apr.	10	17.0	E.	Jan.	10	7.2	W.	Apr.	10	11.0	W.
	20	12.3	E.		20	16.1	E.		20	6.3	W.		20	10.1	W.
	30	11.4	E.		30	15.2	E.		30	17.3	W.		30	9.2	W.
Feb.	9	10.4	E.	May	10	14.4	E.	Feb.	9	16.4	W.	May	10	8.4	W.
	19	9.5	E.		20	13.5	E.		19	15.5	W.		20	7.6	W.
Mar.	1	8.6	E.		30	12.7	E.	Mar.	1	14.6	W.		30	6.7	W.
	11	7.7	E.						11	13.7	W.				
	21	6.8	E.	Dec.	21	8.1	E.		21	12.8	W.	Dec.	21	14.1	W.
	31	17.8	E.		31	7.3	E.		31	11.9	W.		31	13.2	W.

WASHINGTON MEAN TIME OF SUPERIOR GEOCENTRIC CONJUNCTION.

SATELLITE I.

		h	m			h	m			h	m			h	m
Jan.	1	17	56.5	Mar.	22	7	36.3	June	9	22	26.2	Oct.	15	10	32.2
	3	12	23.6		24	2	2.6		11	16	55.4		17	5	2.3
	5	6	50.6		25	20	29.0		13	11	24.7		18	23	32.4
	7	1	17.6		27	14	55.4		15	5	54.1		20	18	2.5
	8	19	44.5		29	9	21.8		17	0	23.5		22	12	32.5
	10	14	11.3		31	3	48.3		18	18	52.9		24	7	2.5
	12	8	38.1	Apr.	1	22	14.9		20	13	22.4		26	1	32.6
	14	3	4.8		3	16	41.6		22	7	51.9		27	20	2.6
	15	21	31.5		5	11	8.3		24	2	21.5		29	14	32.5
	17	15	58.1		7	5	35.1		25	20	51.1		31	9	2.4
	19	10	24.7		9	0	2.0		27	15	20.7	Nov.	2	3	32.3
	21	4	51.2		10	18	28.9		29	9	50.4		3	22	2.2
	22	23	17.6		12	12	55.9	July	1	4	20.2		5	16	32.0
	24	17	44.0		14	7	23.0		2	22	50.0		7	11	1.8
	26	12	10.3		16	1	50.1		4	17	19.8		9	5	31.6
	28	6	36.6		17	20	17.3		6	11	49.6		11	0	1.3
	30	1	2.8		19	14	44.6		8	6	19.4		12	18	31.1
	31	19	28.9		21	9	12.0		10	0	49.3		14	13	0.8
Feb.	2	13	55.0		23	3	39.4		11	19	19.2		16	7	30.4
	4	8	21.1		24	22	6.9		13	13	49.1		18	2	0.0
	6	2	47.1		26	16	34.5		15	8	19.1		19	20	29.6
	7	21	13.1		28	11	2.2		17	2	49.1		21	14	59.1
	9	15	39.1		30	5	29.9		18	21	19.1		23	9	28.5
	11	10	5.1	May	1	23	57.7		20	15	49.2		25	3	57.9
	13	4	31.0		3	18	25.6		22	10	19.3		26	22	27.4
	14	22	57.0		5	12	53.6		24	4	49.4		28	16	56.8
	16	17	22.9		7	7	21.6		25	23	19.5		30	11	26.1
	18	11	48.7		9	1	49.7		27	17	49.6	Dec.	2	5	55.3
	20	6	14.6		10	20	17.8		29	12	19.7		4	0	24.5
	22	0	40.5		12	14	46.0		31	6	49.9		5	18	53.7
	23	19	6.3		14	9	14.3	Aug.	2	1	20.1		7	13	22.8
	25	13	32.2		16	3	42.7		3	19	50.3		9	7	51.9
	27	7	58.0		17	22	11.1		5	14	20.5		11	2	20.9
Mar.	1	2	23.9		19	16	39.6		7	8	50.7		12	20	49.8
	2	20	49.8		21	11	8.1		9	3	21.0		14	15	18.8
	4	15	15.7		23	5	36.7		10	21	51.3		16	9	47.7
	6	9	41.6		25	0	5.4		12	16	21.6		18	4	16.5
	8	4	7.6		26	18	34.2		14	10	51.9		19	22	45.3
	9	22	33.5		28	13	3.0		16	5	22.2		21	17	14.0
	11	16	59.5		30	7	31.9		17	23	52.5		23	11	42.6
	13	11	25.6	June	1	2	0.8						25	6	11.2
	15	5	51.6		2	20	29.8						27	0	39.7
	17	0	17.7		4	14	58.8						28	19	8.2
	18	18	43.8		6	9	27.9						30	13	36.6
	20	13	10.0		8	3	57.0						32	8	5.0

WASHINGTON MEAN TIME OF SUPERIOR GEOCENTRIC CONJUNCTION.

SATELLITE II.

		h	m			h	m			h	m			h	m
Jan.	1	20	25.4	Mar.	24	10	54.3	June	14	3	25.0	Oct.	13	2	18.8
	5	9	38.0		28	0	3.6		17	16	44.7		16	15	42.6
	8	22	51.2		31	13	12.8		21	6	4.7		20	5	6.1
	12	12	2.6	Apr.	4	2	22.9		24	19	25.1		23	18	29.8
	16	1	14.7		7	15	33.1		28	8	45.7		27	7	53.1
	19	14	25.1		11	4	44.1	July	1	22	6.6		30	21	16.6
	23	3	35.9		14	17	55.3		5	11	27.8	Nov.	3	10	39.7
	26	16	45.3		18	7	7.3		9	0	49.3		7	0	2.8
	30	5	55.2		21	20	19.6		12	14	11.0		10	13	25.6
Feb.	2	19	3.8		25	9	32.7		16	3	32.9		14	2	48.4
	6	8	12.8		28	22	46.0		19	16	55.0		17	16	10.7
	9	21	20.7	May	2	12	0.0		23	6	17.3		21	5	33.1
	13	10	29.1		6	1	14.5		26	19	39.8		24	18	54.9
	16	23	36.5		9	14	29.6		30	9	2.5		28	8	16.9
	20	12	44.5		13	3	45.0	Aug.	2	22	25.3	Dec.	1	21	38.1
	24	1	51.6		16	17	1.1		6	11	48.1		5	10	59.6
	27	14	59.4		20	6	17.5		10	1	11.2		9	0	20.1
Mar.	3	4	6.4		23	19	34.5		13	14	34.5		12	13	41.0
	6	17	14.2		27	8	51.9		17	3	57.9		16	3	0.8
	10	6	21.5		30	22	9.8						19	16	20.9
	13	19	29.7	June	3	11	28.0						23	5	39.9
	17	8	37.4		7	0	46.7						26	18	59.1
	20	21	46.0		10	14	5.6						30	8	17.2

SATELLITE III.

		h	m			h	m			h	m			h	m
Jan.	3	19	59.7	Mar.	30	12	24.3	June	24	10	22.0	Oct.	17	8	38.6
	10	23	35.7	Apr.	6	15	50.3	July	1	14	35.6		24	13	2.6
	18	3	7.2		13	19	20.5		8	18	51.5		31	17	25.5
	25	6	34.9		20	22	55.6		15	23	9.5	Nov.	7	21	47.5
Feb.	1	9	58.3		28	2	35.0		23	3	29.5		15	2	7.4
	8	13	18.4	May	5	6	19.6		30	7	51.7		22	6	25.6
	15	16	35.9		12	10	7.9	Aug.	6	12	15.2		29	10	40.8
	22	19	51.9		19	14	0.6		13	16	40.2	Dec.	6	14	53.2
Mar.	1	23	7.7		26	17	57.3		20	21	5.6		13	19	2.6
	9	2	23.9	June	2	21	57.9						20	23	8.8
	16	5	42.0		10	2	2.7						28	3	11.9
	23	9	1.6		17	6	10.6								

SATELLITE IV.

		h	m			h	m			h	m			h	m
Jan.	14	0	13.2	Apr.	7	1	2.0	June	29	16	22.3	Oct.	25	14	34.6
	30	15	22.1		23	16	42.6	July	16	12	0.6	Nov.	11	10	44.2
Feb.	16	5	48.8	May	10	9	20.4	Aug.	2	8	3.8		28	6	29.2
Mar.	4	19	55.7		27	2	54.4		19	4	25.0	Dec.	15	1	41.4
	21	10	11.5	June	12	21	17.6						31	20	10.2

WASHINGTON MEAN TIME.

JANUARY.

d	h	m	s			
1	15	43	5	I.*	Ec.	Dis.
	16	45	17	II.*	Ec.	Dis.
	19	6		I.	Oc.	Re.
	21	50		II.	Oc.	Re.
2	12	56		I.*	Sh.	In.
	14	2		I.*	Tr.	In.
	15	15		I.*	Sh.	Eg.
	16	20		I.*	Tr.	Eg.
3	10	11	18	I.	Ec.	Dis.
	11	16		II.*	Sh.	In.
	13	26		II.*	Tr.	In.
	13	33		I.*	Oc.	Re.
	13	55	31	III.*	Ec.	Dis.
	14	9		II.*	Sh.	Eg.
	16	16		II.*	Tr.	Eg.
	17	18	37	III.*	Ec.	Re.
	18	19		III.*	Oc.	Dis.
	21	40		III.	Oc.	Re.
4	7	24		I.	Sh.	In.
	8	29		I.	Tr.	In.
	9	44		I.	Sh.	Eg.
	10	48		I.*	Tr.	Eg.
5	2	36		IV.	Sh.	In.
	4	39	32	I.	Ec.	Dis.
	6	2	44	II.	Ec.	Dis.
	7	11		IV.	Sh.	Eg.
	8	0		I.	Oc.	Re.
	11	3		II.*	Oc.	Re.
	12	50		IV.*	Tr.	In.
	16	46		IV.*	Tr.	Eg.
6	1	53		I.	Sh.	In.
	2	56		I.	Tr.	In.
	4	12		I.	Sh.	Eg.
	5	15		I.	Tr.	Eg.
	23	7	48	I.	Ec.	Dis.
7	0	33		II.	Sh.	In.
	2	27		I.	Oc.	Re.
	2	38		II.	Tr.	In.
	3	26		II.	Sh.	Eg.
	3	55		III.	Sh.	In.
	5	28		II.	Tr.	Eg.
	7	28		III.	Sh.	Eg.
	8	13		III.	Tr.	In.
	11	34		III.*	Tr.	Eg.
	20	21		I.	Sh.	In.
	21	24		I.	Tr.	In.
	22	40		I.	Sh.	Eg.
	23	42		I.	Tr.	Eg.
8	17	36	4	I.*	Ec.	Dis.
	19	21	19	II.	Ec.	Dis.
	20	54		I.	Oc.	Re.
9	0	16		II.	Oc.	Re.
	14	50		I.*	Sh.	In.
	15	51		I.*	Tr.	In.
	17	9		I.*	Sh.	Eg.
	18	9		I.*	Tr.	Eg.
10	12	4	18	I.*	Ec.	Dis.
	13	49		II.*	Sh.	In.
	15	20		I.*	Oc.	Re.
	15	49		II.*	Tr.	In.
	16	42		II.*	Sh.	Eg.
	17	53	21	III.*	Ec.	Dis.
	18	39		II.*	Tr.	Eg.
	21	15	51	III.	Ec.	Re.
	21	56		III.	Oc.	Dis.
11	1	16		III.	Oc.	Re.
	9	18		I.	Sh.	In.
	10	18		I.*	Tr.	In.
11	11	37		I.*	Sh.	Eg.
	12	36		I.*	Tr.	Eg.
12	6	32	34	I.	Ec.	Dis.
	8	38	48	II	Ec.	Dis.
	9	47		I.*	Oc.	Re.
	13	28		II.*	Oc.	Re.
13	3	46		I.	Sh.	In.
	4	44		I.	Tr.	In.
	6	6		I.	Sh.	Eg.
	7	3		I.	Tr.	Eg.
	12	58	38	IV.*	Ec.	Dis.
	17	17	58	IV.*	Ec.	Re.
	22	16		IV.	Oc.	Dis.
14	1	0	50	I.	Ec.	Dis.
	2	10		IV.	Oc.	Re.
	3	6		II.	Sh.	In.
	4	14		I.	Oc.	Re.
	4	59		II.	Tr.	In.
	5	59		II.	Sh.	Eg.
	7	49		II.	Tr.	Eg.
	7	53		III.	Sh.	In.
	11	25		III.*	Sh.	Eg.
	11	48		III.*	Tr.	In.
	15	7		III.*	Tr.	Eg.
	22	15		I.	Sh.	In.
	23	11		I.	Tr.	In.
15	0	34		I.	Sh.	Eg.
	1	30		I.	Tr.	Eg.
	19	29	8	I.	Ec.	Dis.
	21	57	22	II.	Ec.	Dis.
	22	41		I.	Oc.	Re.
16	2	40		II.	Oc.	Re.
	16	43		I.*	Sh.	In.
	17	38		I.*	Tr.	In.
	19	2		I.	Sh.	Eg.
	19	56		I.	Tr.	Eg.
17	13	57	23	I.*	Ec.	Dis.
	16	22		II.*	Sh.	In.
	17	7		I.*	Oc.	Re.
	18	9		II.*	Tr.	In.
	19	15		II.	Sh.	Eg.
	20	59		II.	Tr.	Eg.
	21	51	8	III.	Ec.	Dis.
18	1	13	1	III.	Ec.	Re.
	1	28		III.	Oc.	Dis.
	4	47		III.	Oc.	Re.
	11	12		I.*	Sh.	In.
	12	5		I.*	Tr.	In.
	13	31		I.*	Sh.	Eg.
	14	23		I.*	Tr.	Eg.
19	8	25	40	I.	Ec.	Dis.
	11	14	52	II.*	Ec.	Dis.
	11	34		I.*	Oc.	Re.
	15	50		II.*	Oc.	Re.
20	5	40		I.	Sh.	In.
	6	31		I.	Tr.	In.
	7	59		I.	Sh.	Eg.
	8	50		I.	Tr.	Eg.
21	2	53	57	I.	Ec.	Dis.
	5	39		II.	Sh.	In.
	6	0		I.	Oc.	Re.
	7	19		II.	Tr.	In.
	8	32		II.	Sh.	Eg.
	10	9		II.*	Tr.	Eg.
	11	50		III.*	Sh.	In.
	15	17		III.*	Tr.	In.
	15	22		III.*	Sh	Eg.
21	18	36		III.*	Tr.	Eg.
	20	34		IV.	Sh.	In.
22	0	8		I.	Sh.	In.
	0	58		I.	Tr.	In.
	1	5		IV.	Sh.	Eg.
	2	28		I.	Sh.	Eg.
	3	16		I.	Tr.	Eg.
	4	33		IV.	Tr.	In.
	8	24		IV.	Tr.	Eg.
	21	22	17	I.	Ec.	Dis.
23	0	27		I.	Oc.	Re.
	0	33	26	II.	Ec.	Dis.
	5	0		II.	Oc.	Re.
	18	37		I.*	Sh.	In.
	19	25		I.	Tr.	In.
	20	56		I.	Sh.	Eg.
	21	43		I.	Tr.	Eg.
24	15	50	34	I.*	Ec.	Dis.
	18	53		I.	Oc.	Re.
	18	56		II.	Sh.	In.
	20	28		II.	Tr.	In.
	21	48		II.	Sh.	Eg.
	23	18		II.	Tr.	Eg.
25	1	49	33	III.	Ec.	Dis.
	8	14		III.	Oc.	Re.
	13	5		I.*	Sh.	In.
	13	51		I.*	Tr.	In.
	15	25		I.*	Sh.	Eg.
	16	10		I.*	Tr.	Eg.
26	10	18	52	I.*	Ec.	Dis.
	13	19		I.*	Oc.	Re.
	13	50	58	II.*	Ec.	Dis.
	18	10		II.*	Oc.	Re.
27	7	34		I.	Sh.	In.
	8	18		I.	Tr.	In.
	9	53		I.	Sh.	Eg.
	10	36		I.*	Tr.	Eg.
28	4	47	11	I.	Ec.	Dis.
	7	46		I.	Oc.	Re.
	8	12		II.	Sh.	In.
	9	37		II.*	Tr.	In.
	11	5		II.*	Sh.	Eg.
	12	26		II.*	Tr.	Eg.
	15	48		III.*	Sh.	In.
	18	42		III.	Tr.	In.
	19	19		III.	Sh.	Eg.
	22	2		III.	Tr.	Eg.
29	2	2		I.	Sh.	In.
	2	44		I.	Tr.	In.
	4	22		I.	Sh.	Eg.
	5	2		I.	Tr.	Eg.
	23	15	32	I.	Ec.	Dis.
30	2	12		I.	Oc.	Re.
	3	9	31	II.	Ec.	Dis.
	6	58	11	IV.	Ec.	Dis.
	7	20		II.	Oc.	Re.
	11	13	12	IV.*	Ec.	Re.
	13	27		IV.*	Oc.	Dis.
	17	17		IV.*	Oc.	Re.
	20	31		I.	Sh.	In.
	21	10		I.	Tr.	In.
	22	50		I.	Sh.	Eg.
	23	29		I.	Tr.	Eg.
31	17	43	51	I.*	Ec.	Dis.
	20	38		I.	Oc.	Re.
	21	29		II.	Sh.	In.
	22	45		II.	Tr.	In.

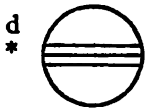
NOTE.—In., denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse.
Oc., denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow; * Visible at Washington.

WASHINGTON MEAN TIME.

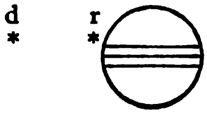
JANUARY.

Phases of the Eclipses of the Satellites for an Inverting Telescope.

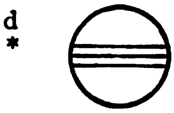
I.



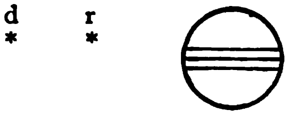
III.



II.



IV.



Configurations at 14ʰ 0ᵐ for an Inverting Telescope.

Day.	West.		East.
1	3· ·2·1	○	4·
2	·3	○	1· ·2 4·
3	○ 2·	○	·1 4· ·3 ●
4	·2 1·	○	·34·
5	○ 4·	○	·2 ·1 ·3
6	4· ·1	○	2· 3·
7	4· 2· 3·	○	1·
8	4· 3· ·2·1	○	
9	4· ·3	○	1· ·2
10	·4 ·3	○	2· ·1 ●
11	·4 2· 1·	○	·3
12	·4	○	·2 ·1 ·3
13	1·	○	2· 3· ·4 ●
14	○ 3· 2·	○	·4 1·
15	3· ·2 ·1	○	·4
16	·3	○	1· ·2 ·4
17	·3	○	2· ·4·1 ●
18	○ 1· 2·	○	·3 4·
19		○	·1 ·3 4· ·2 ●
20	1·	○	2· 3· 4·
21	2·	○	3· ·14·
22	3· ·2 ·1 4·	○	
23	·3 4·	○	1· ·2
24	4· ·3 ·1	○	2·
25	○ 1· 4· 2·	○	·3
26	·4	○	·1 ·3 ·2 ●
27	·4 1·	○	·2 3·
28	·4 2·	○	3· ·1
29	·4 3· ·2 1·	○	
30	3·	○	·2 1· ·4 ●
31	·3 ·1	○	2· ·4

WASHINGTON MEAN TIME.

FEBRUARY.

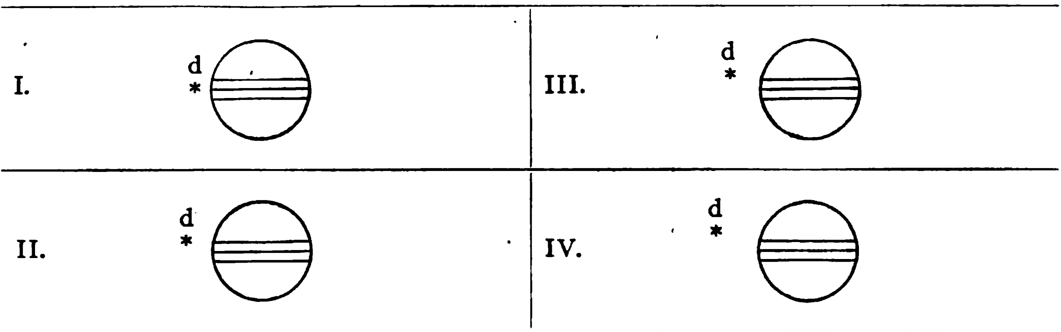
d	h	m	s				d	h	m	s				d	h	m	s			
1	0	22		II.	Sh.	Eg.	10	11	22		I.*	Sh.	In.	19	7	58		I.*	Tr.	In.
	1	34		II.	Tr.	Eg.		11	47		I.*	Tr.	In.		8	1		III.*	Tr.	Eg.
	5	47	27	III.	Ec.	Dis.		13	41		I.*	Sh.	Eg.		10	4		I.*	Sh.	Eg.
	11	38		III.*	Oc.	Re.		14	6		I.*	Tr.	Eg.		10	16		I.*	Tr.	Eg.
	14	59		I.*	Sh.	In.	11	8	34	0	I.*	Ec.	Dis.	20	4	56	5	I.	Ec.	Dis.
	15	37		I.*	Tr.	In.		11	14		I.*	Oc.	Re.		7	24		I.*	Oc.	Re.
	17	19		I.*	Sh.	Eg.		13	20		II.*	Sh.	In.		10	57	51	II.*	Ec.	Dis.
	17	55		I.*	Tr.	Eg.		14	8		II.*	Tr.	In.		14	9		II.*	Oc.	Re.
2	12	12	11	I.*	Ec.	Dis.		16	12		II.*	Sh.	Eg.	21	2	13		I.	Sh.	In.
	15	4		I.*	Oc.	Re.		16	57		II.*	Tr.	Eg.		2	23		I.	Tr.	In.
	16	27	5	II.*	Ec.	Dis.		23	45		III.	Sh.	In.		4	32		I.	Sh.	Eg.
	20	28		II.	Oc.	Re.	12	1	24		III.	Tr.	In.		4	42		I.	Tr.	Eg.
3	9	28		I.*	Sh.	In.		3	15		III.	Sh.	Eg.		23	24	30	I.	Ec.	Dis.
	10	3		I.*	Tr.	In.		4	43		III.	Tr.	Eg.	22	1	50		I.	Oc.	Re.
	11	47		I.*	Sh.	Eg.		5	50		I.	Sh.	In.		5	11		II.	Sh.	In.
	12	21		I.*	Tr.	Eg.		6	13		I.	Tr.	In.		5	29		II.	Tr.	In.
4	6	40	31	I.	Ec.	Dis.		8	9		I.*	Sh.	Eg.		8	3		II.*	Sh.	Eg.
	9	30		I.*	Oc.	Re.		8	32		I.*	Tr.	Eg.		8	18		II.*	Tr.	Eg.
	10	46		II.*	Sh.	In.	13	3	2	25	I.	Ec.	Dis.		17	41	20	III.*	Ec.	Dis.
	11	53		II.*	Tr.	In.		5	40		I.	Oc.	Re.		20	41		I.	Sh.	In.
	13	38		II.*	Sh.	Eg.		8	21	43	II.*	Ec.	Dis.		20	49		I.	Tr.	In.
	14	42		II.*	Tr.	Eg.		11	53		II.*	Oc.	Re.		21	32		III.	Oc.	Re.
	19	47		III.	Sh.	In.	14	0	19		I.	Sh.	In.		23	0		I.	Sh.	Eg.
	22	4		III.	Tr.	In.		0	40		I.	Tr.	In.		23	8		I.	Tr.	Eg.
	23	17		III.	Sh.	Eg.		2	38		I.	Sh.	Eg.	23	17	52	57	I.*	Ec.	Dis.
5	1	24		III.	Tr.	Eg.		2	58		I.	Tr.	Eg.		20	15		I.	Oc.	Re.
	3	56		I	Sh.	In.		21	30	48	I.	Ec.	Dis.	24	0	15	30	II.	Ec.	Dis.
	4	29		I.	Tr.	In.	15	0	6		I.	Oc.	Re.		3	16		II.	Oc.	Re.
	6	15		I.	Sh.	Eg.		2	37		II.	Sh.	In.		8	31		IV.*	Sh.	In.
	6	47		I.	Tr.	Eg.		3	15		II.	Tr.	In.		9	34		IV.*	Tr.	In.
6	1	8	55	I.	Ec.	Dis.		5	29		II.	Sh.	Eg.		12	53		IV.*	Sh.	Eg.
	3	56		I.	Oc.	Re.		6	4		II.	Tr.	Eg.		13	28		IV.*	Tr.	Eg.
	5	45	37	II.	Ec.	Dis.		13	43	16	III.*	Ec.	Dis.		15	10		I.*	Sh.	In.
	9	37		II.*	Oc.	Re.		18	16		III.*	Oc.	Re.		15	15		I.*	Tr.	In.
	22	25		I.	Sh.	In.		18	47		I.	Sh.	In.		17	29		I.*	Sh.	Eg.
	22	55		I.	Tr.	In.		19	6		I.	Tr.	In.		17	34		I.*	Tr.	Eg.
7	0	44		I.	Sh.	Eg.		21	6		I.	Sh.	Eg.	25	12	21	23	I.*	Ec.	Dis.
	1	13		I.	Tr.	Eg.		21	24		I.	Tr.	Eg.		14	41		I.*	Oc.	Re.
	14	32		IV.*	Sh.	In.	16	0	58	51	IV.	Ec.	Dis.		18	28		II.	Sh.	In.
	18	59		IV.	Sh.	Eg.		7	45		IV.*	Oc.	Re.		18	36		II.	Tr.	In.
	19	20		IV.	Tr.	In.		15	59	13	I.*	Ec.	Dis.		21	20		II.	Sh.	Eg.
	19	37	15	I.	Ec.	Dis.		18	32		I.	Oc.	Re.		21	25		II.	Tr.	Eg.
	22	22		I.	Oc.	Re.		21	39	21	II.	Ec.	Dis.	26	7	43		III.*	Sh.	In.
	23	11		IV.	Tr.	Eg.	17	1	1		II.	Oc.	Re.		7	57		III.*	Tr.	In.
8	0	3		II.	Sh.	In.		13	16		I.*	Sh.	In.		9	38		I.*	Sh.	In.
	1	1		II.	Tr.	In.		13	32		I.*	Tr.	In.		9	41		I.*	Tr.	In.
	2	55		II.	Sh.	Eg.		15	35		I.*	Sh.	Eg.		11	11		III.*	Sh.	Eg.
	3	50		II.	Tr.	Eg.		15	50		I.*	Tr.	Eg.		11	17		III.*	Tr.	Eg.
	9	45	25	III.*	Ec.	Dis.	18	10	27	37	I.*	Ec.	Dis.		11	58		I.*	Sh.	Eg.
	14	58		III.*	Oc.	Re.		12	58		I.*	Oc.	Re.		12	0		I.*	Tr.	Eg.
	16	53		I.*	Sh.	In.		15	54		II.*	Sh.	In.	27	6	49	53	I.*	Ec.	Dis.
	17	21		I.*	Tr.	In.		16	22		II.*	Tr.	In.		9	7		I.*	Oc.	Re.
	19	12		I.	Sh.	Eg.		18	46		II.	Sh.	Eg.		13	33	58	II.*	Ec.	Dis.
	19	40		I.	Tr.	Eg.		19	11		II.	Tr.	Eg.		16	24		II.*	Oc.	Re.
9	14	5	38	I.*	Ec.	Dis.	19	3	44		III.	Sh.	In.	28	4	7		I.	Sh.	In.
	16	48		I.*	Oc.	Re.		4	41		III.	Tr.	In.		4	7		I.	Tr.	In.
	19	3	13	II.	Ec.	Dis.		7	13		III.*	Sh.	Eg.		6	26		I.*	Sh.	Eg.
	22	45		II.	Oc.	Re.		7	44		I.*	Sh.	In.		6	26		I.*	Tr.	Eg.

Note.—In. denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse.
Oc. denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow; * Visible at Washington.

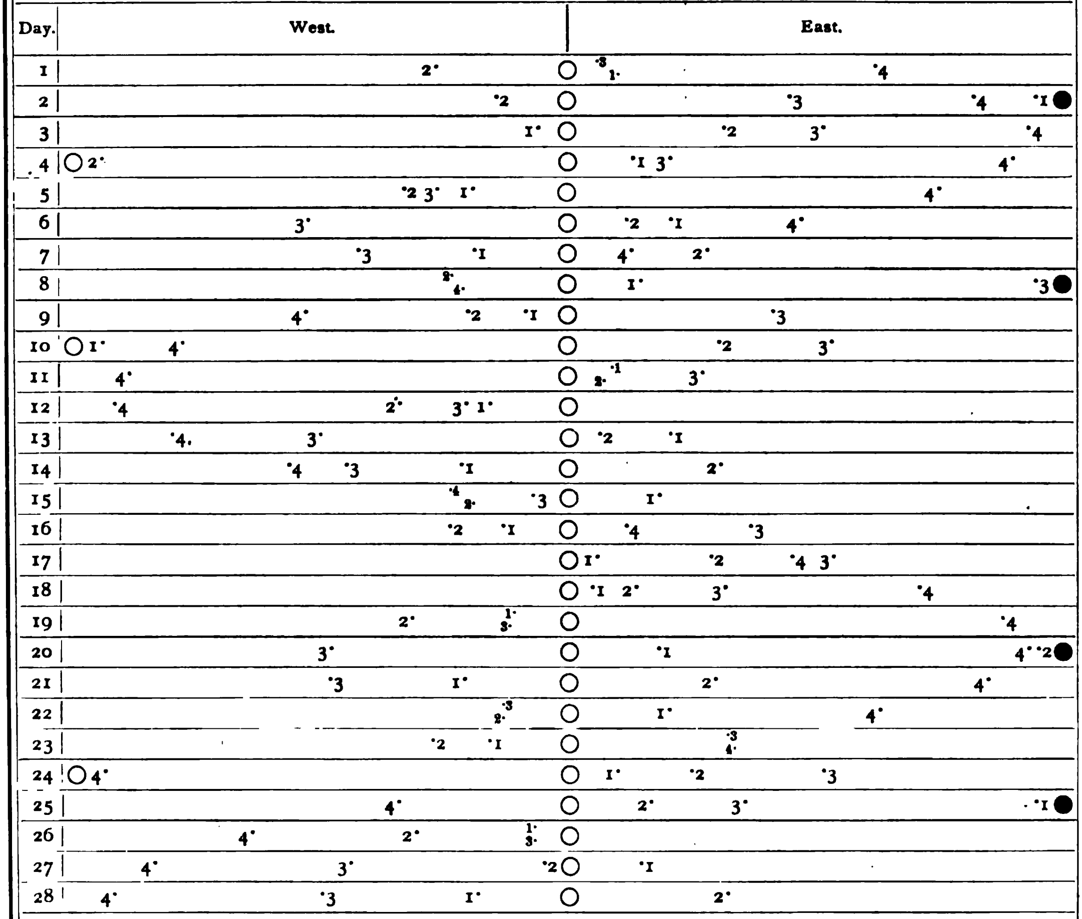
WASHINGTON MEAN TIME.

FEBRUARY.

Phases of the Eclipses of the Satellites for an Inverting Telescope.



Configurations at 13^h 0^m for an Inverting Telescope.



WASHINGTON MEAN TIME.

MARCH.

d	h	m	s			
1	1	15		I.	Oc.	Dis.
	3	32	27	I.	Ec.	Re.
	7	42		II.*	Tr.	In.
	7	45		II.*	Sh.	In.
	10	32		II.*	Tr.	Eg.
	10	37		II.*	Sh.	Eg.
	21	27		III.	Oc.	Dis.
	22	33		I.	Tr.	In.
	22	36		I.	Sh.	In.
2	0	52		I.	Tr.	Eg.
	0	55		I.	Sh.	Eg.
	0	57	57	III.	Ec.	Re.
	19	41		I.	Oc.	Dis.
	22	0	57	I.	Ec.	Re.
3	2	42		II.	Oc.	Dis.
	5	39	35	II.	Ec.	Re.
	16	59		I.*	Tr.	In.
	17	4		I.*	Sh.	In.
	19	18		I.	Tr.	Eg.
	19	23		I.	Sh.	Eg.
4	14	6		I.*	Oc.	Dis.
	16	29	25	I.*	Ec.	Re.
	17	57		IV.*	Oc.	Dis.
	20	49		II.	Tr.	In.
	21	2		II.	Sh.	In.
	23	5	9	IV.	Ec.	Re.
	23	39		II.	Tr.	Eg.
	23	54		II.	Sh.	Eg.
5	11	12		III.*	Tr.	In.
	11	25		I.*	Tr.	In.
	11	33		I.*	Sh.	In.
	11	41		III.*	Sh.	In.
	13	44		I.*	Tr.	Eg.
	13	52		I.*	Sh.	Eg.
	14	33		III.*	Tr.	Eg.
	15	9		III.*	Sh.	Eg.
6	8	32		I.*	Oc.	Dis.
	10	57	58	I.*	Ec.	Re.
	15	49		II.*	Oc.	Dis.
	18	57	53	II.	Ec.	Re.
7	5	51		I.	Tr.	In.
	6	1		I.	Sh.	In.
	8	10		I.*	Tr.	Eg.
	8	20		I.*	Sh.	Eg.
8	2	58		I.	Oc.	Dis.
	5	26	27	I.	Ec.	Re.
	9	56		II.*	Tr.	In.
	10	20		II.*	Sh.	In.
	12	46		II.*	Tr.	Eg.
	13	11		II.*	Sh.	Eg.
9	0	17		I.	Tr.	In.
	0	30		I.	Sh.	In.
	0	43		III.	Oc.	Dis.
	2	36		I.	Tr.	Eg.
	2	49		I.	Sh.	Eg.
	4	55	56	III.	Ec.	Re.
	21	24		I.	Oc.	Dis.
	23	54	59	I.	Ec.	Re.
10	4	57		II.	Oc.	Dis.
	8	15	26	II.*	Ec.	Re.
	18	43		I.	Tr.	In.
	18	58		I.	Sh.	In.
	21	2		I.	Tr.	Eg.
	21	17		I.	Sh.	Eg.
11	15	50		I.*	Oc.	Dis.
	18	23	29	I.	Ec.	Re.
	23	3		II.	Tr.	In.
11	23	37		II.	Sh.	In.
12	1	53		II.	Tr.	Eg.
	2	29		II.	Sh.	Eg.
	13	9		I.*	Tr.	In.
	13	27		I.*	Sh.	In.
	14	28		III.*	Tr.	In.
	15	28		I.*	Tr.	Eg.
	15	40		III.*	Sh.	In.
	15	46		I.*	Sh.	Eg.
	17	50		III.	Tr.	Eg.
	19	7		III.	Sh.	Eg.
	23	42		IV.	Tr.	In.
13	2	31		IV.	Sh.	In.
	3	43		IV.	Tr.	Eg.
	6	48		IV.*	Sh.	Eg.
	10	16		I.*	Oc.	Dis.
	12	52	4	I.*	Ec.	Re.
	18	5		II.	Oc.	Dis.
	21	33	40	II.	Ec.	Re.
14	7	35		I.*	Tr.	In.
	7	56		I.*	Sh.	In.
	9	54		I.*	Tr.	Eg.
	10	15		I.*	Sh.	Eg.
15	4	42		I.	Oc	Dis.
	7	20	35	I.*	Ec.	Re.
	12	11		II.*	Tr.	In.
	12	55		II.*	Sh.	In.
	15	1		II.*	Tr.	Eg.
	15	46		II.*	Sh.	Eg.
16	2	1		I.	Tr.	In.
	2	24		I.	Sh.	In.
	4	1		III.	Oc.	Dis.
	4	20		I.	Tr.	Eg.
	4	43		I.	Sh.	Eg.
	8	54	35	III.*	Ec.	Re.
	23	8		I.	Oc.	Dis.
17	1	49	10	I.	Ec.	Re.
	7	13		II.*	Oc.	Dis.
	10	51	15	II.*	Ec.	Re.
	20	27		I.	Tr.	In.
	20	53		I.	Sh.	In.
	22	46		I.	Tr.	Eg.
	23	12		I.	Sh.	Eg.
18	17	35		I.	Oc.	Dis.
	20	17	42	I.	Ec.	Re.
19	1	18		II.	Tr.	In.
	2	12		II.	Sh.	In.
	4	9		II.	Tr.	Eg.
	5	4		II.	Sh.	Eg.
	14	54		I.*	Tr.	In.
	15	22		I.*	Sh.	In.
	17	12		I.	Tr.	Eg.
	17	41		I.	Sh.	Eg.
	17	46		III.	Tr.	In.
	19	39		III.	Sh.	In.
	21	9		III.	Tr.	Eg.
	23	5		III.	Sh.	Eg.
20	12	1		I.*	Oc.	Dis.
	14	46	20	I.*	Ec.	Re.
	20	21		II.	Oc.	Dis.
21	0	9	26	II.	Ec.	Re.
	8	9		IV.*	Oc.	Dis.
	9	20		I.*	Tr.	In.
	9	50		I.*	Sh.	In.
	11	39		I.*	Tr.	Eg
	12	9		I.*	Sh.	Eg.
21	12	14		IV.*	Oc.	Re.
	13	1	25	IV.*	Ec.	Dis.
	17	1	27	IV.	Ec.	Re.
22	6	27		I.	Oc.	Dis.
	9	14	53	I.*	Ec.	Re.
	14	26		II.*	Tr.	In.
	15	30		II.*	Sh.	In.
	17	17		II.	Tr.	Eg.
	18	21		II.	Sh.	Eg.
23	3	46		I.	Tr.	In.
	4	19		I.	Sh.	In.
	6	5		I.	Tr.	Eg.
	6	38		I.	Sh.	Eg.
	7	20		III.*	Oc.	Dis.
	12	52	44	III.*	Ec.	Re.
24	0	53		I.	Oc.	Dis.
	3	43	30	I.	Ec.	Re.
	9	29		II.*	Oc.	Dis.
	13	27	2	II.*	Ec.	Re.
	22	13		I.	Tr.	In.
	22	48		I.	Sh.	In.
25	0	31		I.	Tr.	Eg.
	1	6		I.	Sh.	Eg.
	19	20		I.	Oc.	Dis.
	22	12	4	I.	Ec.	Re.
26	3	35		II.	Tr.	In.
	4	47		II.	Sh.	In.
	6	25		II.	Tr.	Eg.
	7	39		II.*	Sh.	Eg.
	16	39		I.	Tr	In.
	17	16		I.	Sh.	In.
	18	58		I.	Tr.	Eg.
	19	35		I.	Sh.	Eg.
	21	7		III.	Tr.	In.
	23	38		III.	Sh.	In.
27	0	31		III.	Tr.	Eg.
	3	3		III.	Sh.	Eg.
	13	46		I.*	Oc.	Dis.
	16	40	44	I.	Ec.	Re.
	22	38		II.	Oc.	Dis.
28	2	45	9	II.	Ec.	Re.
	11	6		I.*	Tr.	In.
	11	45		I.*	Sh.	In.
	13	24		I.*	Tr.	Eg.
	14	4		I.*	Sh.	Eg.
29	8	12		I.*	Oc.	Dis.
	11	9	19	I.*	Ec.	Re.
	14	11		IV.*	Tr.	In.
	16	43		II.	Tr.	In.
	18	5		II.	Sh.	In.
	18	19		IV.	Tr.	Eg.
	19	34		II.	Tr.	Eg.
	20	31		IV.	Sh.	In.
	20	56		II.	Sh.	Eg.
30	0	43		IV.	Sh.	Eg.
	5	32		I.	Tr.	In.
	6	13		I.	Sh.	In.
	7	51		I.*	Tr.	Eg.
	8	32		I.*	Sh.	Eg.
	10	42		III.*	Oc.	Dis.
	16	50	55	III.	Ec.	Re.
31	2	39		I.	Oc.	Dis.
	5	37	59	I.	Ec.	Re.
	11	47		II.*	Oc.	Dis.
	16	2	45	II.*	Ec.	Re.
	23	59		I.	Tr.	In.

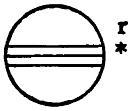
NOTE.—In. denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse. Oc. denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow; * Visible at Washington.

WASHINGTON MEAN TIME.

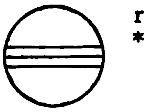
MARCH.

Phases of the Eclipses of the Satellites for an Inverting Telescope.

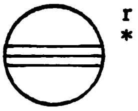
I.



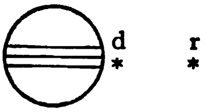
III.



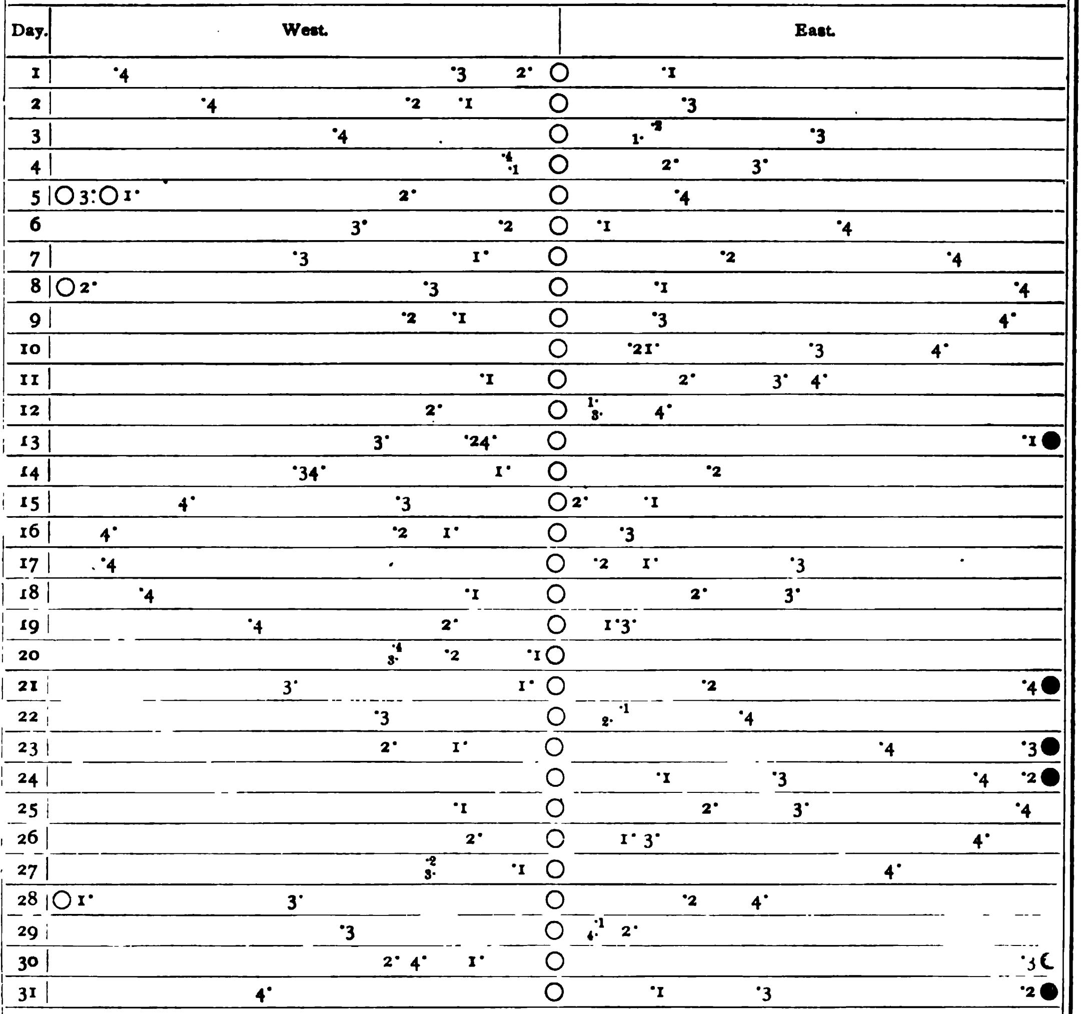
II.



IV.



Configurations at 12h 0m for an Inverting Telescope.



Day.	West.		East.
1	·4 ·3 2·	○	·1
2	·4 ·2 ·1	○	·3
3	·4	○	1· ·2 ·3
4	·4 ·1	○	2· 3·
5	○ 3:○ 1· 2·	○	·4
6	3· ·2	○	·1 ·4
7	·3 1·	○	·2 ·4
8	○ 2· ·3	○	·1 ·4
9	·2 ·1	○	·3 4·
10		○	·21· ·3 4·
11	·1	○	2· 3· 4·
12	2·	○	1· 3· 4·
13	3· ·24·	○	·1 ●
14	·34· 1·	○	·2
15	4· ·3	○	2· ·1
16	4· ·2 1·	○	·3
17	·4	○	·2 1· ·3
18	·4 ·1	○	2· 3·
19	·4 2·	○	1·3·
20	·4 3· ·2 ·1	○	
21	3· 1·	○	·2 ·4 ●
22	·3	○	2· ·1 ·4
23	2· 1·	○	·4 ·3 ●
24		○	·1 ·3 ·4 ·2 ●
25	·1	○	2· 3· ·4
26	2·	○	1· 3· 4·
27	·2 3· ·1	○	4·
28	○ 1· 3·	○	·2 4·
29	·3	○	4· ·1 2·
30	2· 4· 1·	○	·3 ☾
31	4·	○	·1 ·3 ·2 ●

WASHINGTON MEAN TIME.

APRIL.

d	h	m	s			
1	0	42		I.	Sh.	In.
	2	17		I.	Tr.	Eg.
	3	1		I.	Sh.	Eg.
	21	5		I.	Oc.	Dis.
2	0	6	34	I.	Ec.	Re.
	5	52		II.	Tr.	In.
	7	23		II.*	Sh.	In.
	8	43		II.*	Tr.	Eg.
	10	14		II.*	Sh.	Eg.
	18	25		I.	Tr.	In.
	19	11		I.	Sh.	In.
	20	44		I.	Tr.	Eg.
	21	30		I.	Sh.	Eg.
3	0	31		III.	Tr.	In.
	3	37		III.	Sh.	In.
	3	56		III.	Tr.	Eg.
	7	2		III.*	Sh.	Eg.
	15	32		I.*	Oc.	Dis.
	18	35	17	I.	Ec.	Re.
4	0	57		II.	Oc.	Dis.
	5	20	48	II.	Ec.	Re.
	12	52		I.*	Tr.	In.
	13	40		I.*	Sh.	In.
	15	11		I.*	Tr.	Eg.
	15	58		I.	Sh.	Eg.
5	9	59		I.*	Oc.	Dis.
	13	3	54	I.*	Ec.	Re.
	19	2		II.	Tr.	In.
	20	41		II.	Sh.	In.
	21	53		II.	Tr.	Eg.
	23	32		II.	Sh.	Eg.
6	7	19		I.*	Tr.	In.
	8	8		I.*	Sh.	In.
	9	38		I.*	Tr.	Eg.
	10	27		I.*	Sh.	Eg.
	14	7		III.*	Oc.	Dis.
	17	33		III.	Oc.	Re.
	17	34	51	III.	Ec.	Dis.
	20	49	0	III.	Ec.	Re.
	22	56		IV.	Oc.	Dis.
7	3	8		IV.	Oc.	Re.
	4	26		I.	Oc.	Dis.
	7	4	18	IV.*	Ec.	Dis.
	7	32	35	I.*	Ec.	Re.
	10	58	40	IV.*	Ec.	Re.
	14	8		II.*	Oc.	Dis.
	18	38	25	II.	Ec.	Re.
8	1	46		I.	Tr.	In.
	2	37		I.	Sh.	In.
	4	4		I.	Tr.	Eg.
	4	56		I.	Sh.	Eg.
	22	53		I.	Oc.	Dis.
9	2	1	13	I.	Ec.	Re.
	8	13		II.*	Tr.	In.
	9	59		II.*	Sh.	In.
	11	4		II.*	Tr.	Eg.
	12	50		II.*	Sh.	Eg.
	20	13		I.	Tr.	In.
	21	6		I.	Sh.	In.
	22	31		I.	Tr.	Eg.
	23	24		I.	Sh.	Eg.
10	3	59		III.	Tr.	In.
	7	25		III.*	Tr.	Eg.
	7	37		III.*	Sh.	In.
	11	1		III.*	Sh.	Eg.
	17	20		I.	Oc.	Dis.

d	h	m	s			
10	20	29	57	I.	Ec.	Re.
11	3	19		II.	Oc.	Dis.
	7	56	24	II.*	Ec.	Re.
	14	39		I.*	Tr.	In.
	15	34		I.	Sh.	In.
	16	58		I.	Tr.	Eg.
	17	53		I.	Sh.	Eg.
12	11	47		I.*	Oc.	Dis.
	14	58	36	I.*	Ec.	Re.
	21	23		II.	Tr.	In.
	23	17		II.	Sh.	In.
13	0	15		II.	Tr.	Eg.
	2	7		II.	Sh.	Eg.
	9	6		I.*	Tr.	In.
	10	3		I.*	Sh.	In.
	11	25		I.*	Tr.	Eg.
	12	22		I.*	Sh.	Eg.
	17	37		III.	Oc.	Dis.
	21	4		III.	Oc.	Re.
	21	33	54	III.	Ec.	Dis.
14	0	47	16	III.	Ec.	Re.
	6	14		I.	Oc.	Dis.
	9	27	19	I.*	Ec.	Re.
	16	30		II.	Oc.	Dis.
	21	14	0	II.	Ec.	Re.
15	3	33		I.	Tr.	In.
	4	32		I.	Sh.	In.
	5	22		IV.	Tr.	In.
	5	52		I.	Tr	Eg.
	6	50		I.	Sh.	Eg.
	9	38		IV.*	Tr.	Eg.
	14	33		IV.*	Sh.	In.
	18	39		IV.	Sh.	Eg.
16	0	41		I.	Oc.	Dis.
	3	55	58	I.	Ec.	Re.
	10	35		II.*	Tr.	In.
	12	35		II.*	Sh.	In.
	13	26		II.*	Tr.	Eg.
	15	25		II.	Sh.	Eg.
	22	1		I.	Tr.	In.
	23	0		I	Sh.	In.
17	0	20		I.	Tr.	Eg.
	1	19		I.	Sh.	Eg.
	7	31		III.*	Tr.	In.
	10	58		III.*	Tr.	Eg.
	11	36		III.*	Sh.	In.
	14	59		III.	Sh.	Eg.
	19	8		I.	Oc.	Dis.
	22	24	43	I.	Ec.	Re.
18	5	42		II.	Oc.	Dis.
	10	31	54	II.*	Ec.	Re.
	16	28		I.	Tr.	In.
	17	29		I.	Sh.	In.
	18	47		I.	Tr.	Eg.
	19	48		I.	Sh.	Eg.
19	13	35		I.*	Oc.	Dis.
	16	53	24	I.	Ec.	Re.
	23	47		II.	Tr.	In.
20	1	53		II.	Sh.	In.
	2	38		II.	Tr.	Eg.
	4	43		II.	Sh.	Eg.
	10	55		I.*	Tr.	In.
	11	58		I.*	Sh.	In.
	13	14		I.*	Tr.	Eg.
	14	16		I.*	Sh.	Eg.
	21	12		III.	Oc.	Dis.

d	h	m	s			
21	0	39		III.	Oc.	Re.
	1	33	34	III.	Ec.	Dis.
	4	46	8	III.	Ec.	Re.
	8	2		I.*	Oc.	Dis.
	11	22	9	I.*	Ec.	Re.
	18	54		II.	Oc.	Dis.
	23	49	29	II.	Ec.	Re.
22	5	23		I.	Tr.	In.
	6	26		I.	Sh.	In.
	7	42		I.*	Tr.	Eg.
	8	45		I.*	Sh.	Eg.
23	2	30		I.	Oc.	Dis.
	5	50	49	I.	Ec.	Re.
	13	0		II.*	Tr.	In.
	14	33		IV.	Oc.	Dis.
	15	11		II.	Sh.	In.
	15	51		II.	Tr.	Eg.
	18	1		II.	Sh.	Eg.
	18	52		IV.	Oc.	Re.
	23	50		I.	Tr.	In.
24	0	55		I.	Sh.	In.
	1	7	16	IV.	Ec.	Dis.
	2	9		I.	Tr.	Eg.
	3	14		I.	Sh.	Eg.
	4	55	34	IV.	Ec.	Re.
	11	8		III.*	Tr.	In.
	14	36		III.	Tr.	Eg.
	15	35		III.	Sh.	In.
	18	57		III.	Sh.	Eg.
	20	57		I.	Oc.	Dis.
25	0	19	36	I.	Ec.	Re.
	8	7		II.*	Oc.	Dis.
	13	7	19	II.*	Ec.	Re.
	18	18		I.	Tr.	In.
	19	24		I.	Sh.	In.
	20	37		I.	Tr.	Eg.
	21	42		I.	Sh	Eg.
26	15	25		I.	Oc.	Dis.
	18	48	18	I.	Ec.	Re.
27	2	13		II.	Tr.	In.
	4	29		II.	Sh.	In.
	5	4		II.	Tr.	Eg.
	7	19		II *	Sh.	Eg.
	12	45		I.*	Tr.	In.
	13	53		I.*	Sh.	In.
	15	4		I.	Tr.	Eg.
	16	11		I.	Sh.	Eg.
28	0	51		III.	Oc.	Dis
	4	19		III.	Oc.	Re.
	5	33	9	III.	Ec.	Dis.
	8	44	53	III.*	Ec.	Re.
	9	53		I.*	Oc.	Dis.
	13	17	5	I.*	Ec.	Re.
	21	20		II.	Oc.	Dis.
29	2	24	53	II.	Ec.	Re.
	7	13		I.	Tr.	In.
	8	21		I.*	Sh.	In.
	9	32		I.*	Tr.	Eg.
	10	40		I.*	Sh.	Eg.
30	4	20		I.	Oc.	Dis.
	7	45	46	I.*	Ec.	Re.
	15	27		II.	Tr.	In.
	17	47		II.	Sh.	In.
	18	18		II.	Tr.	Eg.
	20	38		II.	Sh.	Eg.

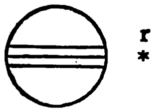
NOTE.—In. denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse.
Oc. denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow; * Visible at Washington.

WASHINGTON MEAN TIME.

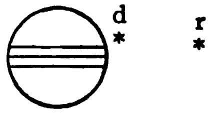
APRIL.

Phases of the Eclipses of the Satellites for an Inverting Telescope.

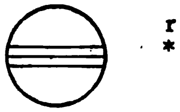
I.



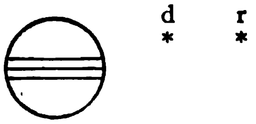
III.



II.



IV.



Configurations at 11ʰ 0ᵐ for an Inverting Telescope.

Day.	West.		East.
1	4· 1·	○	2· 3·
2	4· 2·	○	1· 3·
3	·4 ·2 3··1	○	
4	·4 3·	○	1· ·2
5	·4 ·3	○	2· ·1 ●
6	2· ·4 ·3 1·	○	
7	·2	○	·4 ·1 ·3
8	1·	○	·2 ·43·
9	○ 2·	○	1· 3· ·4
10	·2 ·1 3·	○	·4
11	3·	○	1·² 4·
12	·3 ·1	○	2· 4·
13	○ 1· 2· ·3	○	4·
14	·2	○	·1 ·3 4·
15	1· 4·	○	·2 ·3
16	○ 2· 4·	○	·1 3·
17	4· ·2 ·1 3·	○	
18	4· 3·	○	·2 1·
19	4· ·3 ·1	○	2·
20	○ 1· ·4 ·3 2·	○	
21	·4 ·2	○	·3 ·1 ●
22	·4 1·	○	·2 ·3
23	·4	○	2· ·1 3·
24	2· 1·	○	3· ·4
25	3·	○	1· ·4 ·2 ●
26	·3 ·1	○	2· ·4
27	·3 2·	○	1· ·4
28	·2	○	·3 4· ·1 ●
29	1·	○	·2 ·3 4·
30		○	·1 2· 3· 4·

WASHINGTON MEAN TIME.

MAY.

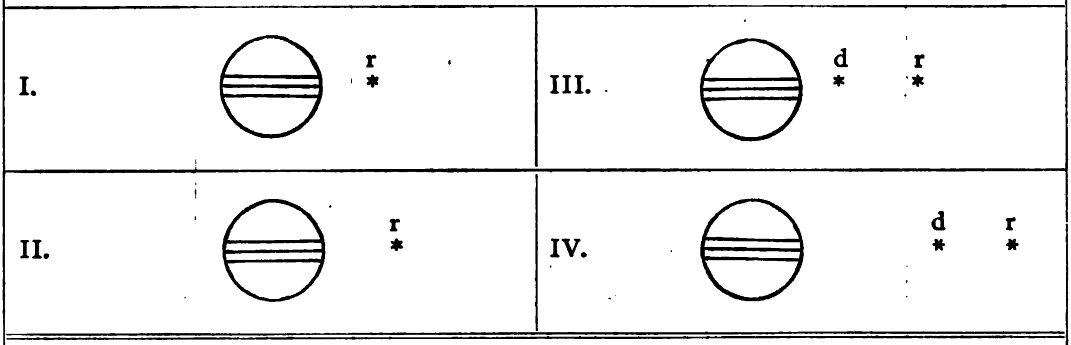
d	h	m	s			
1	1	41		I.	Tr.	In.
	2	50		I.	Sh.	In.
	4	0		I.	Tr.	Eg.
	5	9		I.	Sh.	Eg.
	14	48		III.	Tr.	In.
	18	17		III.	Tr.	Eg.
	19	34		III.	Sh.	In.
	21	29		IV.	Tr.	In.
	22	48		I.	Oc.	Dis.
	22	56		III.	Sh.	Eg.
2	1	49		IV.	Tr.	Eg.
	2	14	35	I.	Ec.	Re.
	8	34		IV.*	Sh.	In.
	10	34		II.*	Oc.	Dis.
	12	35		IV.*	Sh.	Eg.
	15	42	37	II.	Ec.	Re.
	20	8		I.	Tr.	In.
	21	19		I.	Sh.	In.
	22	27		I.	Tr.	Eg.
	23	37		I.	Sh.	Eg.
3	17	16		I.	Oc.	Dis.
	20	43	18	I.	Ec.	Re.
4	4	41		II.	Tr.	In.
	7	5		II.	Sh.	In.
	7	33		II.*	Tr.	Eg.
	9	56		II.*	Sh.	Eg.
	14	36		I.	Tr.	In.
	15	47		I.	Sh.	In.
	16	55		I.	Tr.	Eg.
	18	6		I.	Sh.	Eg.
5	4	35		III.	Oc.	Dis.
	8	4		III.*	Oc.	Re.
	9	33	18	III.*	Ec.	Dis.
	11	44		I.*	Oc.	Dis.
	12	44	13	III.*	Ec.	Re.
	15	12	5	I.	Ec.	Re.
	23	49		II.	Oc.	Dis.
6	5	0	10	II.	Ec.	Re.
	9	4		I.*	Tr.	In.
	10	16		I.*	Sh.	In.
	11	23		I.*	Tr.	Eg.
	12	35		I.*	Sh.	Eg.
7	6	12		I.	Oc.	Dis.
	9	40	48	I.*	Ec.	Re.
	17	56		II.	Tr.	In.
	20	24		II.	Sh.	In.
	20	48		II.	Tr.	Eg.
	23	14		II.	Sh.	Eg.
8	3	32		I.	Tr.	In.
	4	45		I.	Sh.	In.
	5	51		I.	Tr.	Eg.
	7	3		I.	Sh.	Eg.
	18	34		III.	Tr.	In.
	22	3		III.	Tr.	Eg.
	23	33		III.	Sh.	In.
9	0	40		I.	Oc.	Dis.
	2	54		III.	Sh.	Eg.
	4	9	37	I.	Ec.	Re.
	13	4		II.*	Oc.	Dis.
	18	17	51	II.	Ec.	Re.
	22	0		I.	Tr.	In.
	23	14		I.	Sh.	In.
10	0	19		I.	Tr.	Eg.
	1	32		I.	Sh.	Eg.
	7	9		IV.	Oc.	Dis.
	11	32		IV.*	Oc.	Re.
	19	8		I.	Oc.	Dis.
	19	10	32	IV.	Ec.	Dis.
10	22	38	21	I.	Ec.	Re.
	22	52	24	IV.	Ec.	Re.
11	7	12		II.	Tr.	In.
	9	42		II.*	Sh.	In.
	10	4		II.*	Tr.	Eg.
	12	32		II.*	Sh.	Eg.
	16	28		I.	Tr.	In.
	17	42		I.	Sh.	In.
	18	47		I.	Tr.	Eg.
	20	1		I.	Sh.	Eg.
12	8	23		III.*	Oc.	Dis.
	11	53		III.*	Oc.	Re.
	13	32	53	III.	Ec.	Dis.
	13	36		I.	Oc.	Dis.
	16	42	57	III.	Ec.	Re.
	17	7	10	I.	Ec.	Re.
13	2	19		II.	Oc.	Dis.
	7	35	21	II.*	Ec.	Re.
	10	56		I.*	Tr.	In.
	12	11		I.*	Sh.	In.
	13	15		I.	Tr.	Eg.
	14	29		I.	Sh.	Eg.
14	8	5		I.*	Oc.	Dis.
	11	35	53	I.*	Ec.	Re.
	20	28		II.	Tr.	In.
	23	1		II.	Sh.	In.
	23	20		II.	Tr.	Eg.
15	1	51		II.	Sh.	Eg.
	5	25		I.	Tr.	In.
	6	40		I.	Sh.	In.
	7	44		I.*	Tr.	Eg.
	8	58		I.*	Sh.	Eg.
	22	24		III.	Tr.	In.
16	1	54		III.	Tr.	Eg.
	2	33		I.	Oc.	Dis.
	3	33		III.	Sh.	In.
	6	4	43	I.	Ec.	Re.
	6	53		III.	Sh.	Eg.
	15	35		II.	Oc.	Dis.
	20	52	56	II.	Ec.	Re.
	23	53		I.	Tr.	In.
17	1	8		I.	Sh.	In.
	2	12		I.	Tr.	Eg.
	3	27		I.	Sh.	Eg.
	21	2		I.	Oc.	Dis.
18	0	33	28	I.	Ec.	Re.
	9	44		II.*	Tr.	In.
	12	19		II.*	Sh.	In.
	12	36		II.*	Tr.	Eg.
	14	33		IV.	Tr.	In.
	15	9		II.	Sh.	Eg.
	18	21		I.	Tr.	In.
	18	55		IV.	Tr.	Eg.
	19	37		I.	Sh.	In.
	20	40		I.	Tr.	Eg.
	21	55		I.	Sh.	Eg.
19	2	36		IV.	Sh.	In.
	6	30		IV.	Sh.	Eg.
	12	16		III *	Oc.	Dis.
	15	30		I.	Oc.	Dis.
	15	45		III.	Oc.	Re.
	17	32	25	III.	Ec.	Dis.
	19	2	17	I.	Ec.	Re.
	20	41	37	III.	Ec.	Re.
20	4	52		II.	Oc.	Dis.
	10	10	24	II.*	Ec.	Re.
	12	50		I.	Tr.	In.
	14	6		I.	Sh.	In.
20	15	9		I.	Tr.	Eg.
	16	24		I.	Sh.	Eg.
21	9	59		I.*	Oc.	Dis.
	13	31	1	I.	Ec.	Re.
	23	2		II.	Tr.	In.
22	1	37		II.	Sh.	In.
	1	54		II.	Tr.	Eg.
	4	27		II.	Sh.	Eg.
	7	18		I.	Tr.	In.
	8	35		I.*	Sh.	In.
	9	37		I.*	Tr.	Eg.
	10	53		I.*	Sh.	Eg.
23	2	19		III.	Tr.	In.
	4	27		I.	Oc.	Dis.
	5	48		III.	Tr.	Eg.
	7	32		III.	Sh.	In.
	7	59	52	I.*	Ec.	Re.
	10	51		III.*	Sh.	Eg.
	18	9		II.	Oc.	Dis.
	23	27	55	II.	Ec.	Re.
24	1	47		I.	Tr.	In.
	3	3		I.	Sh.	In.
	4	6		I.	Tr.	Eg.
	5	22		I.	Sh.	Eg.
	22	56		I.	Oc.	Dis.
25	2	28	37	I.	Ec.	Re.
	12	20		II.*	Tr.	In.
	14	56		II.	Sh.	In.
	15	12		II.	Tr.	Eg.
	17	45		II.	Sh.	Eg.
	20	15		I.	Tr.	In.
	21	32		I.	Sh.	In.
	22	34		I.	Tr.	Eg.
	23	50		I.	Sh.	Eg.
26	16	13		III.	Oc.	Dis.
	17	24		I.	Oc.	Dis.
	19	42		III.	Oc.	Re.
	20	57	27	I.	Ec.	Re.
	21	31	48	III.	Ec.	Dis.
27	0	40	8	III.	Ec.	Re.
	0	42		IV.	Oc.	Dis.
	5	6		IV.	Oc.	Re.
	7	26		II.	Oc.	Dis.
	12	45	21	II.	Ec.	Re.
	13	14	39	IV.	Ec.	Dis.
	14	44		I.	Tr.	In.
	16	1		I.	Sh.	In.
	16	49	40	IV.	Ec.	Re.
	17	3		I.	Tr.	Eg.
	18	19		I.	Sh.	Eg.
28	11	53		I.*	Oc.	Dis.
	15	26	11	I.	Ec.	Re.
29	1	38		II.	Tr.	In.
	4	15		II.	Sh.	In.
	4	31		II.	Tr.	Eg.
	7	4		II.	Sh.	Eg.
	9	13		I.*	Tr.	In.
	10	29		I.*	Sh.	In.
	11	32		I.*	Tr.	Eg.
	12	48		I.	Sh.	Eg.
30	6	18		III.	Tr.	In.
	6	22		I.	Oc.	Dis.
	9	48		III.*	Tr.	Eg.
	9	55	1	I.*	Ec.	Re.
	11	32		III.*	Sh.	In.
	14	50		III.	Sh.	Eg.
	20	44		II.	Oc.	Dis.
31	2	2	47	II.	Ec.	Re.
	3	42		I.	Tr.	In.
	4	58		I.	Sh.	In.
	6	1		I.	Tr.	Eg.
	7	16		I.	Sh.	Eg.

NOTE.—In. denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse.
Oc. denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow; *Visible at Washington.

WASHINGTON MEAN TIME.

MAY.

Phases of the Eclipses of the Satellites for an Inverting Telescope.



Configurations at 10h 30m for an Inverting Telescope.

Day.	West.		East.
1	2· 1·	○	3· 4·
2	3· 4· ·2	○	·1
3	3· 4· ·1	○	2·
4	4· ·3 2·	○	1·
5	4· ·2 ·1	○	·3 ●
6	○ 1· ·4	○	·2 ·3
7	·4	○	·1 2· 3·
8	·4 2· 1·	○	3·
9	·4 3· ·2	○	·1
10	3· ·1	○	·2 ·4 ●
11	○ 2· ·3	○	1· ·4
12	·2 ·1	○	·4 ·3 ●
13		○	1· ·2 ·3 ·4
14		○	2· 3· ·4·1 ●
15	1·2·	○	3· 4·
16	3· ·2	○	·1 4·
17	3· 1·	○	·2 4·
18	○ 2· ·3	○	4· 1·
19	·2 4· ·1 ·3	○	
20	4·	○	·2 1· ·3
21	4·	○	2· 3· ·1 ●
22	4· 2· 1·	○	3·
23	·4 ·2 3·	○	·1
24	·4 3· 1·	○	·2
25	·4 ·3	○	2· ·1
26	2· ·1 ·4 ·3	○	
27		○	·4 1· ·3 ·2 ●
28	·1	○	2· ·4 ·3
29	○ 1· 2·	○	3· ·4
30	·2 3·	○	·1 ·4
31	3· 1·	○	·2 4·

WASHINGTON MEAN TIME.

JUNE.

d	h	m	s			
1	0	51		I.	Oc.	Dis.
	4	23	47	I.	Ec.	Re.
	14	57		II.	Tr.	In.
	17	33		II.	Sh.	In.
	17	50		II.	Tr.	Eg.
	20	22		II.	Sh.	Eg.
	22	10		I.	Tr.	In.
	23	27		I.	Sh.	In.
2	0	29		I.	Tr.	Eg.
	1	45		I.	Sh.	Eg.
	19	20		I.	Oc.	Dis.
	20	13		III.	Oc.	Dis.
	22	52	37	I.	Ec.	Re.
	23	43		III.	Oc.	Re.
3	1	31	17	III.	Ec.	Dis.
	4	38	44	III.	Ec.	Re.
	10	2		II.*	Oc.	Dis.
	15	20	9	II.	Ec.	Re.
	16	39		I.	Tr.	In.
	17	56		I.	Sh.	In.
	18	58		I.	Tr.	Eg.
	20	14		I.	Sh.	Eg.
4	8	31		IV.*	Tr.	In.
	12	53		IV.	Tr.	Eg.
	13	49		I.	Oc.	Dis.
	17	21	21	I.	Ec.	Re.
	20	39		IV.	Sh.	In.
5	0	25		IV.	Sh.	Eg.
	4	17		II.	Tr.	In.
	6	52		II.	Sh.	In.
	7	9		II.	Tr.	Eg.
	9	41		II.*	Sh.	Eg.
	11	8		I.*	Tr.	In.
	12	24		I.	Sh.	In.
	13	27		I.	Tr.	Eg.
	14	42		I.	Sh.	Eg.
6	8	18		I.*	Oc.	Dis.
	10	21		III.*	Tr.	In.
	11	50	13	I.	Ec.	Re.
	13	50		III.	Tr.	Eg.
	15	32		III.	Sh.	In.
	18	49		III.	Sh.	Eg.
	23	21		II.	Oc.	Dis.
7	4	37	31	II.	Ec.	Re.
	5	37		I.	Tr.	In.
	6	53		I.	Sh.	In.
	7	56		I.*	Tr.	Eg.
	9	11		I.*	Sh.	Eg.
8	2	47		I.	Oc.	Dis.
	6	18	58	I.	Ec.	Re.
	17	37		II.	Tr.	In.
	20	10		II.	Sh.	In.
	20	28		II.	Tr.	Eg.
	22	59		II.	Sh.	Eg.
9	0	6		I.	Tr.	In.
	1	22		I.	Sh.	In.
	2	25		I.	Tr.	Eg.
	3	40		I.	Sh.	Eg.
	21	17		I.	Oc.	Dis.
10	0	18		III.	Oc.	Dis.
	0	47	49	I.	Ec.	Re.
	3	47		III.	Oc.	Re.
	5	31	19	III.	Ec.	Dis.
	8	37	52	III.*	Ec.	Re.
	12	40		II.	Oc.	Dis.
	17	54	51	II.	Ec.	Re.
	18	35		I.	Tr.	In.
	19	50		I.	Sh.	In.

d	h	m	s			
10	20	55		I.	Tr.	Eg.
	22	8		I.	Sh.	Eg.
11	15	46		I.	Oc.	Dis.
	19	16	33	I.	Ec.	Re.
12	6	57		II.	Tr.	In.
	9	29		II.*	Sh.	In.
	9	49		II.*	Tr.	Eg.
	12	18		II.	Sh.	Eg.
	13	5		I.	Tr.	In.
	14	19		I.	Sh.	In.
	15	24		I.	Tr.	Eg.
	16	37		I.	Sh.	Eg.
	19	6		IV.	Oc.	Dis.
	23	29		IV.	Oc.	Re.
13	7	18	22	IV.	Ec.	Dis.
	10	15		I.*	Oc.	Dis.
	10	46	7	IV.*	Ec.	Re.
	13	45	24	I.	Ec.	Re.
	14	26		III.	Tr.	In.
	17	55		III.	Tr.	Eg.
	19	31		III.	Sh.	In.
	22	47		III.	Sh.	Eg.
14	1	59		II.	Oc.	Dis.
	7	12	8	II.	Ec.	Re.
	7	34		I	Tr.	In.
	8	48		I.*	Sh.	In.
	9	53		I.*	Tr.	Eg.
	11	6		I.*	Sh.	Eg.
15	4	44		I.	Oc.	Dis.
	8	14	10	I.*	Ec.	Re.
	20	17		II.	Tr.	In.
	22	47		II.	Sh.	In.
	23	10		II.	Tr.	Eg.
16	1	36		II.	Sh.	Eg.
	2	3		I.	Tr.	In.
	3	16		I.	Sh.	In.
	4	22		I.	Tr.	Eg.
	5	34		I.	Sh.	Eg.
	23	14		I.	Oc.	Dis.
17	2	43	0	I.	Ec.	Re.
	4	26		III.	Oc.	Dis.
	7	55		III.*	Oc.	Re.
	9	31	8	III.*	Ec.	Dis.
	12	36	46	III.	Ec.	Re.
	15	19		II.	Oc.	Dis.
	20	29	25	II.	Ec.	Re.
	20	32		I.	Tr.	In.
	21	45		I.	Sh.	In.
	22	51		I.	Tr.	Eg.
18	0	3		I.	Sh.	Eg.
	17	43		I.	Oc.	Dis.
	21	11	43	I.	Ec.	Re.
19	9	38		II.*	Tr.	In.
	12	6		II.	Sh.	In.
	12	31		II.	Tr.	Eg.
	14	55		II.	Sh.	Eg.
	15	2		I.	Tr.	In.
	16	14		I.	Sh.	In.
	17	21		I.	Tr.	Eg.
	18	32		I.	Sh.	Eg.
20	12	13		I.	Oc.	Dis.
	15	40	35	I.	Ec.	Re.
	18	35		III.	Tr.	In.
	22	4		III.	Tr.	Eg.
	23	30		III.	Sh.	In.
21	2	45		III.	Sh.	Eg.
	3	14		IV.	Tr.	In.

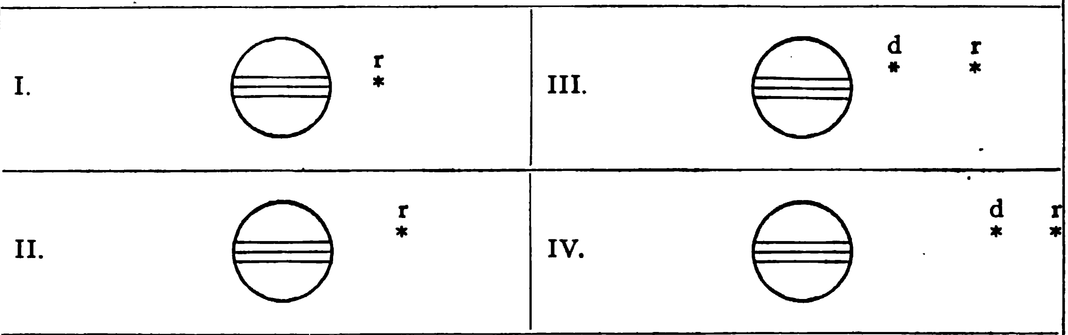
d	h	m	s			
21	4	39		II.	Oc.	Dis.
	7	36		IV.	Tr.	Eg.
	9	31		I.*	Tr.	In.
	9	46	38	II.*	Ec.	Re.
	10	42		I.*	Sh.	In.
	11	50		I.	Tr.	Eg.
	13	0		I.	Sh.	Eg.
	14	41		IV.	Sh.	In.
	18	22		IV.	Sh.	Eg.
22	6	42		I.	Oc.	Dis.
	10	9	20	I.*	Ec.	Re.
	22	59		II.	Tr.	In.
23	1	24		II.	Sh.	In.
	1	52		II.	Tr.	Eg.
	4	0		I.	Tr.	In.
	4	13		II.	Sh.	Eg.
	5	11		I.	Sh.	In.
	6	19		I.	Tr.	Eg.
	7	29		I.	Sh.	Eg.
24	1	12		I.	Oc.	Dis.
	4	38	10	I.	Ec.	Re.
	8	38		III.*	Oc.	Dis.
	12	6		III.	Oc.	Re.
	13	31	25	III.	Ec.	Dis.
	16	36	8	III.	Ec.	Re.
	17	59		II.	Oc.	Dis.
	22	30		I.	Tr.	In.
	23	3	52	II.	Ec.	Re.
	23	40		I.	Sh.	In.
25	0	49		I.	Tr.	Eg.
	1	58		I.	Sh.	Eg.
	19	41		I.	Oc.	Dis.
	23	6	54	I.	Ec.	Re.
26	12	22		II.	Tr.	In.
	14	43		II.	Sh.	In.
	15	14		II.	Tr.	Eg.
	16	59		I.	Tr.	In.
	17	32		II.	Sh.	Eg.
	18	8		I.	Sh.	In.
	19	18		I.	Tr.	Eg.
	20	26		I.	Sh.	Eg.
27	14	11		I.	Oc.	Dis.
	17	35	44	I.	Ec.	Re.
	22	47		III.	Tr.	In.
28	2	14		III.	Tr.	Eg.
	3	29		III.	Sh.	In.
	6	43		III.	Sh.	Eg.
	7	20		II.	Oc.	Dis.
	11	29		I.	Tr.	In.
	12	21	2	II.	Ec.	Re.
	12	37		I.	Sh.	In.
	13	48		I.	Tr.	Eg.
	14	55		I.	Sh.	Eg.
29	8	41		I.*	Oc.	Dis.
	12	4	29	I.	Ec.	Re.
	14	12		IV.	Oc.	Dis.
	18	32		IV.	Oc.	Re.
30	1	22	0	IV.	Ec.	Dis.
	1	44		II.	Tr.	In.
	4	2		II.	Sh.	In.
	4	36		II.	Tr.	Eg.
	4	42	0	IV.	Ec.	Re.
	5	58		I.	Tr.	In.
	6	51		II.	Sh.	Eg.
	7	5		I.	Sh.	In.
	8	17		I.*	Tr.	Eg.
	9	23		I.*	Sh.	Eg.

NOTE.—In. denotes ingress, Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse.
Oc. denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow; * Visible at Washington.

WASHINGTON MEAN TIME.

JUNE.

Phases of the Eclipses of the Satellites for an Inverting Telescope.



Configurations at 9h 30m for an Inverting Telescope.

Day.	West.		East.
1	·3	○	2· ·1 4·
2	2· ·3 1·	○	4·
3	·2	○	1· ·3 4·
4	○ 4· ·1	○	2· ·3
5	4· 2·	○	1· 3·
6	4· ·2	○	3· ·1 ●
7	4· 3· 1·	○	·2
8	4· ·3	○	·1 2·
9	·4 ·3 2· 1·	○	
10	·4 ·2	○	·3 1·
11	·4 ·1	○	·2 ·3
12	○ 2· ·4	○	1· 3·
13	·2 ·1	○	3· ·4 ●
14	○ 1· 3·	○	·2 ·4
15	3·	○	·1 2· ·4
16	·3 2· 1·	○	·4
17	·2	○	·3 ·1 4·
18	·1	○	·2 ·3 4·
19		○	2· 1· 3· 4·
20	·2 ·1	○	3· 4·
21	3· 4·	○	1· ·2 ●
22	3· 4·	○	2· ·1 ●
23	4· ·3 2· 1·	○	
24	4· ·2	○	·1 ·3 ●
25	4· 1·	○	·2 ·3
26	·4	○	2· 1· 3·
27	·4 2· ·1	○	3·
28	·4 3·	○	1· ·2 ●
29	3· ·4	○	2· ·1 ●
30	·3 2· 1·	○	·4

WASHINGTON MEAN TIME.

JULY.

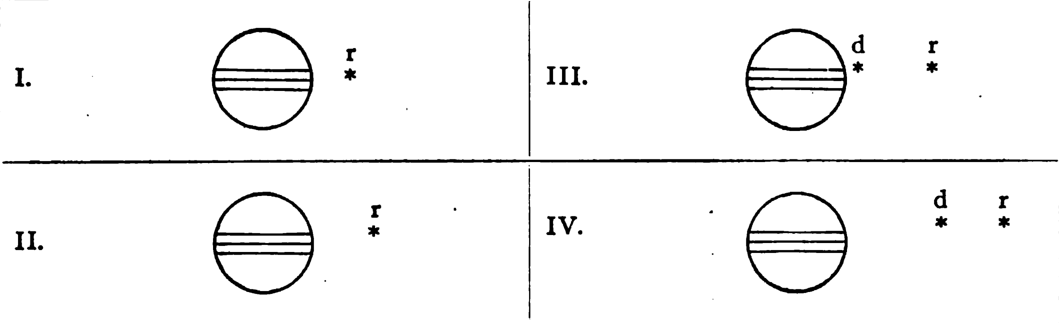
d	h	m	s			
1	3	11		I.	Oc.	Dis.
	6	33	19	I.	Ec.	Re.
	12	52		III.	Oc.	Dis.
	16	19		III.	Oc.	Re.
	17	31	3	III.	Ec.	Dis.
	20	34	49	III.	Ec.	Re.
	20	41		II.	Oc.	Dis.
2	0	28		I.	Tr.	In.
	1	34		I.	Sh.	In.
	1	38	13	II.	Ec.	Re.
	2	47		I.	Tr.	Eg.
	3	52		I.	Sh.	Eg.
	21	40		I.	Oc.	Dis.
3	1	2	2	I.	Ec.	Re.
	15	7		II.	Tr.	In.
	17	21		II.	Sh.	In.
	17	59		II.	Tr.	Eg.
	18	57		I.	Tr.	In.
	20	3		I.	Sh.	In.
	20	10		II.	Sh.	Eg.
	21	17		I.	Tr.	Eg.
	22	21		I.	Sh.	Eg.
4	16	10		I.	Oc.	Dis.
	19	30	52	I.	Ec.	Re.
5	3	2		III.	Tr.	In.
	6	29		III.	Tr.	Eg.
	7	28		III.	Sh.	In.
	10	2		II.	Oc.	Dis.
	10	42		III.	Sh.	Eg.
	13	27		I.	Tr.	In.
	14	31		I.	Sh.	In.
	14	55	20	II.	Ec.	Re.
	15	46		I.	Tr.	Eg.
	16	49		I.	Sh.	Eg.
6	10	40		I.	Oc.	Dis.
	13	59	36	I.	Ec.	Re.
7	4	30		II.	Tr.	In.
	6	39		II.	Sh.	In.
	7	21		II.	Tr.	Eg.
	7	57		I.*	Tr.	In.
	9	0		I.*	Sh.	In.
	9	28		II.*	Sh.	Eg.
	10	16		I.	Tr.	Eg.
	11	18		I.	Sh.	Eg.
	22	35		IV.	Tr.	In.
8	2	53		IV.	Tr.	Eg.
	5	10		I.	Oc.	Dis.
	8	28	26	I.*	Ec.	Re.
	8	43		IV.*	Sh.	In.
	12	16		IV.	Sh.	Eg.
	17	8		III.	Oc.	Dis.
	20	35		III.	Oc.	Re.
	21	30	33	III.	Ec.	Dis.
	23	23		II.	Oc.	Dis.
9	0	33	22	III.	Ec.	Re.
	2	27		I.	Tr.	In.
	3	29		I.	Sh.	In.
	4	12	27	II.	Ec.	Re.
	4	46		I.	Tr.	Eg.
	5	47		I.	Sh.	Eg.
	23	40		I.	Oc.	Dis.
10	2	57	8	I.	Ec.	Re.
	17	53		II.	Tr.	In.
	19	58		II.	Sh.	In.
	20	44		II.	Tr.	Eg.
	20	56		I.	Tr.	In.
	21	57		I.	Sh.	In.
10	22	47		II.	Sh.	Eg.
	23	15		I.	Tr.	Eg.
11	0	15		I.	Sh.	Eg.
	18	10		I.	Oc.	Dis.
	21	25	57	I.	Ec.	Re.
12	7	19		III.	Tr.	In.
	10	46		III.	Tr.	Eg.
	11	27		III.	Sh.	In.
	12	45		II.	Oc.	Dis.
	14	40		III.	Sh.	Eg.
	15	26		I.	Tr.	In.
	16	26		I.	Sh.	In.
	17	29	32	II.	Ec.	Re.
	17	45		I.	Tr.	Eg.
	18	44		I.	Sh.	Eg.
13	12	40		I.	Oc.	Dis.
	15	54	41	I.	Ec.	Re.
14	7	16		II.	Tr.	In.
	9	16		II.*	Sh.	In.
	9	56		I.	Tr.	In.
	10	7		II.	Tr.	Eg.
	10	55		I.	Sh.	In.
	12	5		II.	Sh.	Eg.
	12	15		I.	Tr.	Eg.
	13	12		I.	Sh.	Eg.
15	7	10		I.	Oc.	Dis.
	10	23	30	I.	Ec.	Re.
	21	27		III.	Oc.	Dis.
16	0	52		III.	Oc.	Re.
	1	29	51	III.	Ec.	Dis.
	2	7		II.	Oc.	Dis.
	4	26		I.	Tr.	In.
	4	31	41	III.	Ec.	Re.
	5	23		I.	Sh.	In.
	6	45		I.	Tr.	Eg.
	6	46	36	II.	Ec.	Re.
	7	41		I.	Sh.	Eg.
	9	53		IV.	Oc.	Dis.
	14	8		IV.	Oc.	Re.
	19	26	6	IV.	Ec.	Dis.
	22	37	52	IV.	Ec.	Re.
17	1	40		I.	Oc.	Dis.
	4	52	11	I.	Ec.	Re.
	20	40		II.	Tr.	In.
	22	35		II.	Sh.	In.
	22	56		I.	Tr.	In.
	23	31		II.	Tr.	Eg.
	23	52		I.	Sh.	In.
18	1	15		I.	Tr.	Eg.
	1	24		II.	Sh.	Eg.
	2	10		I.	Sh.	Eg.
	20	10		I.	Oc.	Dis.
	23	21	0	I.	Ec.	Re.
19	11	39		III.	Tr.	In.
	15	4		III.	Tr.	Eg.
	15	27		III.	Sh.	In.
	15	29		II.	Oc.	Dis.
	17	26		I.	Tr.	In.
	18	20		I.	Sh.	In.
	18	39		III.	Sh.	Eg.
	19	44		I.	Tr.	Eg.
	20	3	38	II.	Ec.	Re.
	20	38		I.	Sh.	Eg.
20	14	40		I.	Oc.	Dis.
	17	49	42	I.	Ec.	Re.
21	10	4		II.	Tr.	In.
	11	53		II.	Sh.	In.
21	11	55		I.	Tr.	In.
	12	49		I.	Sh.	In.
	12	55		II.	Tr.	Eg.
	14	14		I.	Tr.	Eg.
	14	42		II.	Sh.	Eg.
	15	7		I.	Sh.	Eg.
22	9	10		I.	Oc.	Dis.
	12	18	30	I.	Ec.	Re.
23	1	47		III.	Oc.	Dis.
	4	52		II.	Oc.	Dis.
	5	12		III.	Oc.	Re.
	5	29	12	III.	Ec.	Dis.
	6	25		I.	Tr.	In.
	7	18		I.	Sh.	In.
	8	30	3	III.*	Ec.	Re.
	8	44		I.*	Tr.	Eg.
	9	20	41	II.	Ec.	Re.
	9	35		I.	Sh.	Eg.
24	3	40		I.	Oc.	Dis.
	6	47	10	I.	Ec.	Re.
	18	28		IV.	Tr.	In.
	22	39		IV.	Tr.	Eg.
	23	28		II.	Tr.	In.
25	0	55		I.	Tr.	In.
	1	14		II.	Sh.	In.
	1	46		I.	Sh.	In.
	2	19		II.	Tr.	Eg.
	2	46		IV.	Sh.	In.
	3	14		I.	Tr.	Eg.
	4	1		II.	Sh.	Eg.
	4	4		I.	Sh.	Eg.
	6	10		IV.	Sh.	Eg.
	22	10		I.	Oc.	Dis.
26	1	15	58	I.	Ec.	Re.
	16	0		III.	Tr.	In.
	18	14		II.	Oc.	Dis.
	19	25		III.	Tr.	Eg.
	19	25		I.	Tr.	In.
	19	26		III.	Sh.	In.
	20	15		I.	Sh.	In.
	21	44		I.	Tr.	Eg.
	22	32		I.	Sh.	Eg.
	22	37		III.	Sh.	Eg.
	22	37	41	II.	Ec.	Re.
27	16	40		I.	Oc.	Dis.
	19	44	39	I.	Ec.	Re.
28	12	52		II.	Tr.	In.
	13	55		I.	Tr.	In.
	14	31		II.	Sh.	In.
	14	43		I.	Sh.	In.
	15	43		II.	Tr.	Eg.
	16	14		I.	Tr.	Eg.
	17	1		I.	Sh.	Eg.
	17	19		II.	Sh.	Eg.
29	11	10		I.	Oc.	Dis.
	14	13	27	I.	Ec.	Re.
30	6	10		III.	Oc.	Dis.
	7	37		II.	Oc.	Dis.
	8	25		I.*	Tr.	In.
	9	12		I.	Sh.	In.
	10	44		I.	Tr.	Eg.
	11	30		I.	Sh.	Eg.
	11	54	40	II.	Ec.	Re.
	12	28	52	III.	Ec.	Re.
31	5	40		I.	Oc.	Dis.
	8	42	5	I.	Ec.	Re.

NOTE.—In. denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse.
Oc. denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow; * Visible at Washington.

WASHINGTON MEAN TIME.

JULY.

Phases of the Eclipses of the Satellites for an Inverting Telescope.



Configurations at 8h 30m for an Inverting Telescope.

Day.	West.		East.
1	·2 ·3	○	·1 ·4
2	1·	○	·2 ·3 ·4
3		○	2··1 ·3 ·4
4	2· ·1	○	3· 4·
5	·4 3·	○	1· 4·
6	3· ·1	○	·2 4·
7	○ 1· ·3 2·	○	4·
8	·2 ·3 4·	○	·1
9	4· 1·	○	·2 ·3
10	4·	○	·1 2· ·3
11	4· 2· 1·	○	3·
12	○ 3··4 ·2	○	1·
13	·4 3· ·1	○	·2
14	○ 2· ·4 ·3	○	1·
15	·4 ·2 ·3	○	·1 ●
16	1· ·4	○	·2 ·3
17		○	·1 ·4 2· ·3
18	1· 2·	○	3· ·4
19	·2	○	3· 1· ·4
20	3· ·1	○	·2 ·4
21	·3	○	2· 1· 4·
22	·3 2· ·1	○	4·
23	○ 1·	○	4· ·2 ● ·3 ●
24		○	·1 4· 2· ·3
25	1· 2· 4·	○	3·
26	4· ·2	○	3· ·1
27	4· 3· ·1	○	·2
28	4· 3·	○	2·1·
29	·4 ·3 2· ·1	○	
30	○ 1· ·4	○	·2 ● ·3 ●
31	·4	○	2· ·3 ·1 ●

WASHINGTON MEAN TIME.

AUGUST.

d	h	m	s			
1	2	17		II.	Tr.	In.
	2	55		I.	Tr.	In.
	3	41		I.	Sh.	In.
	3	50		II.	Sh.	In.
	5	8		II.	Tr.	Eg.
	5	14		I.	Tr.	Eg.
	5	58		I.	Sh.	Eg.
	6	38		II.	Sh.	Eg.
2	0	11		I.	Oc.	Dis.
	3	10	53	I.	Ec.	Re.
	6	0		IV.	Oc.	Dis.
	10	7		IV.	Oc.	Re.
	13	29	36	IV.	Ec.	Dis.
	16	32	32	IV.	Ec.	Re.
	20	23		III.	Tr.	In.
	21	0		II.	Oc.	Dis.
	21	25		I.	Tr.	In.
	22	9		I.	Sh.	In.
	23	25		III.	Sh.	In.
	23	44		I.	Tr.	Eg.
	23	46		III.	Tr.	Eg.
3	0	27		I.	Sh.	Eg.
	1	11	39	II.	Ec.	Re.
	2	35		III.	Sh.	Eg.
	18	41		I.	Oc.	Dis.
	21	39	32	I.	Ec.	Re.
4	15	41		II.	Tr.	In.
	15	55		I.	Tr.	In.
	16	38		I.	Sh.	In.
	17	8		II.	Sh.	In.
	18	14		I.	Tr.	Eg.
	18	32		II.	Tr.	Eg.
	18	55		I.	Sh.	Eg.
	19	56		II.	Sh.	Eg.
5	13	11		I.	Oc.	Dis.
	16	8	18	I.	Ec.	Re.
6	10	23		II.	Oc.	Dis.
	10	25		I.	Tr.	In.
	10	34		III.	Oc.	Dis.
	11	6		I.	Sh.	In.
	12	44		I.	Tr.	Eg.
	13	24		I.	Sh.	Eg.
	14	28	37	II.	Ec.	Re.
	16	27	23	III.	Ec.	Re.
7	7	41		I.*	Oc.	Dis.
	10	36	56	I.	Ec.	Re.
8	4	56		I.	Tr.	In.
	5	6		II.	Tr.	In.
	5	35		I.	Sh.	In.
	6	27		II.	Sh.	In.
	7	14		I.	Tr.	Eg.
	7	52		I.*	Sh.	Eg.
	7	57		II.*	Tr.	Eg.
	9	15		II.	Sh.	Eg.
9	2	12		I.	Oc.	Dis.
	5	5	41	I.	Ec.	Re.
	23	26		I.	Tr.	In.
	23	46		II.	Oc.	Dis.
10	0	3		I.	Sh.	In.
	0	47		III.	Tr.	In.
	1	44		I.	Tr.	Eg.
	2	21		I.	Sh.	Eg.
	3	23		III.	Sh.	In.
	3	45	34	II.	Ec.	Re.
	4	8		III.	Tr.	Eg.
	6	32		III.	Sh.	Eg.
	14	42		IV.	Tr.	In.
	18	43		IV.	Tr.	Eg.
10	20	42		I.	Oc.	Dis.
	20	48		IV.	Sh.	In.
	23	34	21	I.	Ec.	Re.
11	0	4		IV.	Sh.	Eg.
	17	56		I.	Tr.	In.
	18	31		II.	Tr.	In.
	18	32		I.	Sh.	In.
	19	45		II.	Sh.	In.
	20	14		I.	Tr.	Eg.
	20	49		I.	Sh.	Eg.
	21	22		II.	Tr.	Eg.
	22	33		II.	Sh.	Eg.
12	15	12		I.	Oc.	Dis.
	18	3	6	I.	Ec.	Re.
13	12	26		I.	Tr.	In.
	13	1		I.	Sh.	In.
	13	9		II.	Oc.	Dis.
	14	45		I.	Tr.	Eg.
	15	0		III.	Oc.	Dis.
	15	18		I.	Sh.	Eg.
	17	2	29	II.	Ec.	Re.
	20	26	16	III.	Ec.	Re.
14	9	43		I.	Oc.	Dis.
	12	31	42	I.	Ec.	Re.
15	6	56		I.	Tr.	In.
	7	29		I.*	Sh.	In.
	7	56		II.	Tr.	In.
	9	4		II.	Sh.	In.
	9	15		I.	Tr.	Eg.
	9	46		I.	Sh.	Eg.
	10	47		II.	Tr.	Eg.
	11	52		II.	Sh.	Eg.
16	4	13		I.	Oc.	Dis.
	7	0	26	I.	Ec.	Re.

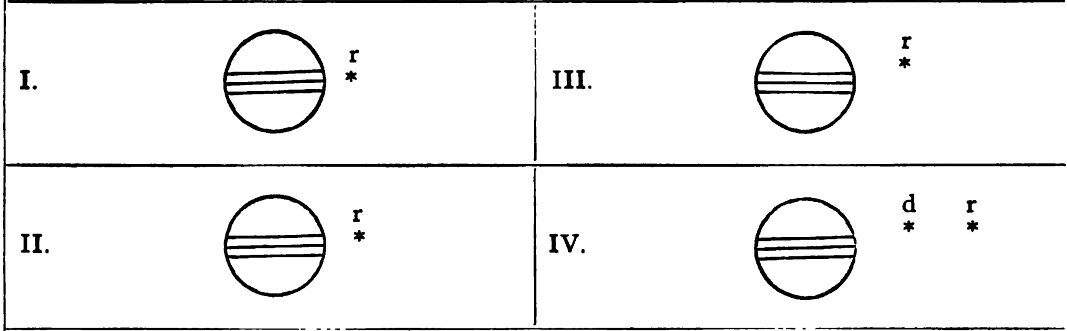
By reason of the proximity of JUPITER to the SUN the phenomena of the satellites are not given from August 17 to October 15.

NOTE.—In. denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse. Oc. denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow; * Visible at Washington.

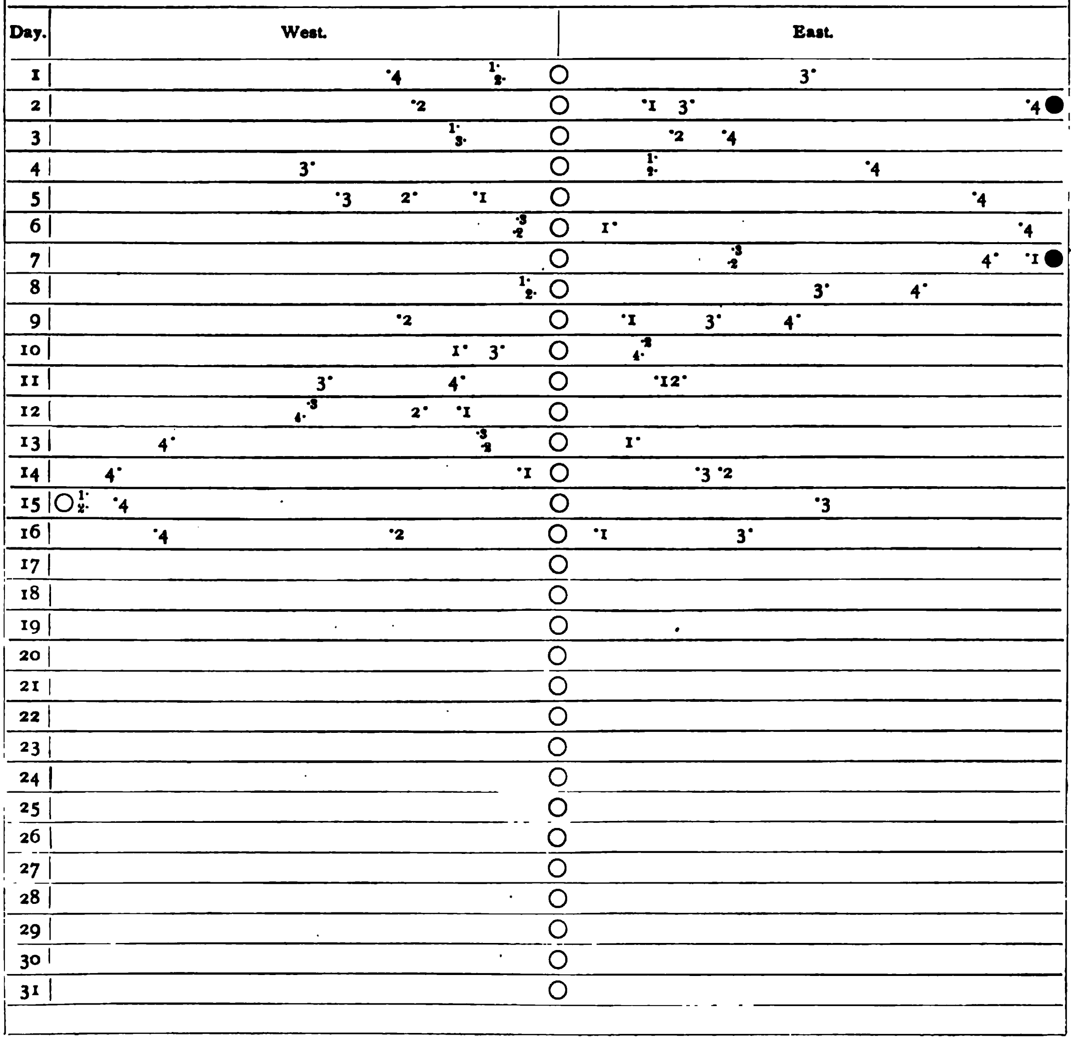
WASHINGTON MEAN TIME.

AUGUST.

Phases of the Eclipses of the Satellites for an Inverting Telescope.



Configurations at 8h 0m for an Inverting Telescope.



WASHINGTON MEAN TIME.

OCTOBER.

By reason of the proximity of Jupiter to the Sun the phenomena of the satellites are not given from August 17 to October 15.

d	h	m	s				d	h	m	s				d	h	m	s			
16	6	5		I.	Sh.	In.	**20**	22	7		III.	Sh.	Eg.	**25**	23	49	54	I.	Ec.	Dis.
	6	32		I.	Tr.	In.	**21**	0	17		III.	Tr.	Eg.	**26**	2	41		I.	Oc.	Re.
	8	22		I.	Sh.	Eg.		13	30		I.	Sh.	In.		20	56		I.	Sh.	In.
	8	49		I.	Tr.	Eg.		14	3		I.	Tr.	In.		21	33		I.	Tr.	In.
	13	24	51	II.	Ec.	Dis.		15	47		I.	Sh.	Eg.		23	12		I.	Sh.	Eg.
	17	6		II.*	Oc.	Re.		16	20		I.	Tr.	Eg.		23	50		I.	Tr.	Eg.
	20	56		IV.	Sh.	In.		21	47		II.	Sh.	In.	**27**	5	16	54	II.	Ec.	Dis.
	23	27		IV.	Sh.	Eg.		22	53		II.	Tr.	In.		9	16		II.	Oc.	Re.
17	1	23		IV.	Tr.	In.	**22**	0	33		II.	Sh.	Eg.		18	18	17	I.	Ec.	Dis.
	3	27	37	I.	Ec.	Dis.		1	40		II.	Tr.	Eg.		21	11		I.	Oc.	Re.
	3	57		IV.	Tr.	Eg.		10	53	2	I.	Ec.	Dis.		23	7		III.	Sh.	In.
	5	18	5	III.	Ec.	Dis.		13	41		I.	Oc.	Re.	**28**	1	43		III.	Tr.	In.
	6	11		I.	Oc.	Re.	**23**	7	59		I.	Sh.	In.		2	4		III.	Sh.	Eg.
	10	9		III.	Oc.	Re.		8	33		I.	Tr.	In.		4	40		III.	Tr.	Eg.
18	0	34		I.	Sh.	In.		10	16		I.	Sh.	Eg.		15	24		I.	Sh.	In.
	1	3		I.	Tr.	In.		10	50		I.	Tr.	Eg.		16	3		I.	Tr.	In.
	2	51		I.	Sh.	Eg.		15	59	56	II.	Ec.	Dis.		17	41		I.*	Sh.	Eg.
	3	20		I.	Tr.	Eg.		19	53		II.	Oc.	Re.		18	20		I.	Tr.	Eg.
	8	30		II.	Sh.	In.	**24**	5	21	26	I.	Ec.	Dis.	**29**	0	22		II.	Sh.	In.
	9	30		II.	Tr.	In.		8	11		I.	Oc.	Re.		1	41		II.	Tr.	In.
	11	16		II.	Sh.	Eg.		9	16	7	III.	Ec.	Dis.		3	8		II.	Sh.	Eg.
	12	17		II.	Tr.	Eg.		14	32		III.	Oc.	Re.		4	28		II.	Tr.	Eg.
	21	56	7	I.	Ec.	Dis.	**25**	2	27		I.	Sh.	In.		12	46	46	I.	Ec.	Dis.
19	0	41		I.	Oc.	Re.		3	3		I.	Tr.	In.		15	41		I.	Oc.	Re.
	19	2		I.	Sh.	In.		4	44		I.	Sh.	Eg.	**30**	9	52		I.	Sh.	In.
	19	33		I.	Tr.	In.		5	20		I.	Tr.	Eg.		10	33		I.	Tr.	In.
	21	19		I.	Sh.	Eg.		7	45	44	IV.	Ec.	Dis.		12	9		I.	Sh.	Eg.
	21	50		I.	Tr.	Eg.		9	53	4	IV.	Ec.	Re.		12	50		I.	Tr.	Eg.
20	2	42	48	II.	Ec.	Dis.		11	5		II.	Sh.	In.		18	34	6	II.	Ec.	Dis.
	6	30		II.	Oc.	Re.		12	18		II.	Tr.	In.		22	40		II.	Oc.	Re.
	16	24	32	I.	Ec.	Dis.		13	17		IV.	Oc.	Dis.	**31**	7	15	7	I.	Ec.	Dis.
	19	8		III.	Sh.	In.		13	51		II.	Sh.	Eg.		10	11		I.	Oc.	Re.
	19	11		I.	Oc.	Re.		15	4		II.	Tr.	Eg.		13	14	9	III.	Ec.	Dis.
	21	18		III.	Tr.	In.		15	52		IV.	Oc.	Re.		18	53		III.	Oc.	Re.

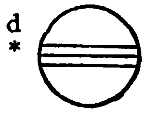
Note.—In. denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse.
Oc. denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow; * Visible at Washington.

WASHINGTON MEAN TIME.

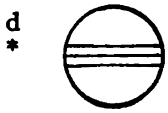
OCTOBER.

Phases of the Eclipses of the Satellites for an Inverting Telescope.

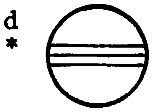
I.



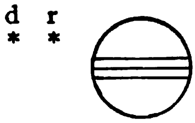
III.



II.



IV.



Configurations at 17ʰ 0ᵐ for an Inverting Telescope.

Day.	West.		East.
1		○	
2		○	
3		○	
4		○	
5		○	
6		○	
7		○	
8		○	
9		○	
10		○	
11		○	
12		○	
13		○	
14		○	
15		○	
16	·3 1·	○	4· ·2 ●
17	4·	○	·31· 2·
18	4· ·1 2·	○	·3
19	4· ·2	○	1· 3·
20	4·	○	3· ·2 ·1 ●
21	·4 3· 1·	○	2·
22	·4 3· 2·	○	·1
23	·4 ·3 1·	○	·2 ●
24	·4	○	·3 ·1 2·
25	·1 2·	○	·4 ·3
26	·2	○	1· ·4 3·
27	·1	○	3· ·2 ·4
28	○ 1· 3·	○	2· ·4
29	3· 2·	○	·1 ·4
30	·3 1· ·2	○	4·
31		○	·1 ·2 4· ·3 ●

WASHINGTON MEAN TIME.

NOVEMBER.

d	h	m	s				d	h	m	s				d	h	m	s			
1	4	21		I.	Sh.	In.	11	7	2		III.	Sh.	In.	20	18	46		I.	Tr.	Eg.
	5	3		I.	Tr.	In.		9	47		IV.	Oc.	Dis.	21	2	17	3	II.	Ec.	Dis.
	6	38		I.	Sh.	Eg.		9	57		III.	Sh.	Eg.		6	55		II.	Oc.	Re.
	7	19		I.	Tr.	Eg.		10	28		III.	Tr.	In.		12	55	34	I.	Ec.	Dis.
	13	40		II.	Sh.	In.		11	42		IV.	Oc.	Re.		16	7		I.*	Oc.	Re.
	15	5		II.	Tr.	In.		13	19		III.	Tr.	Eg.	22	1	9	15	III.	Ec.	Dis.
	16	26		II.*	Sh.	Eg.		19	11		I.	Sh.	In.		3	51	41	III.	Ec.	Re.
	17	51		II.*	Tr.	Eg.		20	2		I.	Tr.	In.		5	3		III.	Oc.	Dis.
2	1	43	34	I.	Ec.	Dis.		21	28		I.	Sh.	Eg.		7	48		III.	Oc.	Re.
	4	41		I.	Oc.	Re.		22	18		I.	Tr.	Eg.		10	1		I.	Sh.	In.
	14	53		IV.	Sh.	In.	12	5	32		II.	Sh.	In.		11	0		I.	Tr.	In.
	17	18		IV.*	Sh.	Eg.		7	14		II.	Tr.	In.		12	17		I.	Sh.	Eg.
	21	48		IV.	Tr.	In.		8	17		II.	Sh.	Eg.		13	15		I.	Tr.	Eg.
	22	49		I.	Sh.	In.		10	0		II.	Tr.	Eg.		21	23		II.	Sh.	In.
	23	33		I.	Tr.	In.		16	33	53	I.*	Ec.	Dis.		23	21		II.	Tr.	In.
3	0	5		IV.	Tr.	Eg.		19	39		I.	Oc.	Re.	23	0	9		II.	Sh.	Eg.
	1	6		I.	Sh.	Eg.	13	13	39		I.	Sh.	In.		2	6		II.	Tr.	Eg.
	1	49		I.	Tr.	Eg.		14	31		I.	Tr.	In.		7	23	55	I.	Ec.	Dis.
	7	51	4	II.	Ec.	Dis.		15	56		I.*	Sh.	Eg.		10	36		I.	Oc.	Re.
	12	3		II.	Oc.	Re.		16	48		I.*	Tr.	Eg.	24	4	29		I.	Sh.	In.
	20	11	55	I.	Ec.	Dis.		23	42	39	II.	Ec.	Dis.		5	29		I.	Tr.	In.
	23	10		I.	Oc.	Re.	14	4	11		II.	Oc.	Re.		6	46		I.	Sh.	Eg.
4	3	5		III.	Sh.	In.		11	2	12	I.	Ec.	Dis.		7	45		I.	Tr.	Eg.
	6	1		III.	Sh.	Eg.		14	9		I.	Oc.	Re.		15	34	4	II.*	Ec.	Dis.
	6	7		III.	Tr.	In.		21	10	47	III.	Ec.	Dis.		20	17		II.	Oc.	Re.
	9	0		III.	Tr.	Eg.		23	54	23	III.	Ec.	Re.	25	1	52	13	I.	Ec.	Dis.
	17	17		I.*	Sh.	In.	15	0	43		III.	Oc.	Dis.		5	6		I.	Oc.	Re.
	18	3		I.*	Tr.	In.		3	32		III.	Oc.	Re.		14	58		III.	Sh.	In.
	19	34		I.	Sh.	Eg.		8	8		I.	Sh.	In.		17	51		III.*	Sh.	Eg.
	20	19		I.	Tr.	Eg.		9	1		I.	Tr.	In.		19	7		III.	Tr.	In.
5	2	57		II.	Sh.	In.		10	24		I.	Sh.	Eg.		21	50		III.	Tr.	Eg.
	4	28		II.	Tr.	In.		11	17		I.	Tr.	Eg.		22	58		I.	Sh.	In.
	5	43		II.	Sh.	Eg.		18	49		II.	Sh.	In.		23	59		I.	Tr.	In.
	7	14		II.	Tr.	Eg.		20	37		II.	Tr.	In.	26	1	14		I.	Sh.	Eg.
	14	40	22	I.	Ec.	Dis.		21	35		II.	Sh.	Eg.		2	14		I.	Tr.	Eg.
	17	40		I.*	Oc.	Re.		23	22		II.	Tr.	Eg.		10	40		II.	Sh.	In.
6	11	46		I.	Sh.	In.	16	5	30	34	I.	Ec.	Dis.		12	43		II.	Tr.	In.
	12	32		I.	Tr.	In.		8	38		I.	Oc.	Re.		13	26		II.	Sh.	Eg.
	14	3		I.	Sh.	Eg.	17	2	36		I.	Sh.	In.		15	27		II.*	Tr.	Eg.
	14	49		I.	Tr.	Eg.		3	31		I.	Tr.	In.		20	20	35	I.	Ec.	Dis.
	21	8	20	II.	Ec.	Dis.		4	52		I.	Sh.	Eg.		23	35		I.	Oc.	Re.
7	1	26		II.	Oc.	Re.		5	47		I.	Tr.	Eg.	27	17	26		I.*	Sh.	In.
	9	8	43	I.	Ec.	Dis.		12	59	38	II.	Ec.	Dis.		18	28		I.*	Tr.	In.
	12	10		I.	Oc.	Re.		17	33		II.*	Oc.	Re.		19	42		I.	Sh.	Eg.
	17	12	39	III.*	Ec.	Dis.		23	58	53	I.	Ec.	Dis.		19	53	3	IV.	Ec.	Dis.
	19	57	24	III.	Ec.	Re.	18	3	8		I.	Oc.	Re.		20	44		I.	Tr.	Eg.
	20	22		III.	Oc.	Dis.		11	0		III.	Sh.	In.		21	28	10	IV.	Ec.	Re.
	23	13		III.	Oc.	Re.		13	54		III.	Sh.	Eg.	28	4	51	34	II.	Ec.	Dis.
8	6	14		I.	Sh.	In.		14	49		III.	Tr.	In.		6	6		IV.	Oc.	Dis.
	7	2		I.	Tr.	In.		17	36		III.*	Tr.	Eg.		6	52		IV.	Oc.	Re.
	8	31		I.	Sh.	Eg.		21	4		I.	Sh.	In.		9	39		II.	Oc.	Re.
	9	18		I.	Tr.	Eg.		22	0		I.	Tr.	In.		14	48	51	I.*	Ec.	Dis.
	16	14		II.*	Sh.	In.		23	21		I.	Sh.	Eg.		18	4		I.*	Oc.	Re.
	17	51		II.*	Tr.	In.	19	0	16		I.	Tr.	Eg.	29	5	7	1	III.	Ec.	Dis.
	19	0		II.	Sh.	Eg.		8	6		II.	Sh.	In.		7	48	17	III.	Ec.	Re.
	20	37		II.	Tr.	Eg.		8	55		IV.	Sh.	In.		9	20		III.	Oc.	Dis.
9	3	37	7	I.	Ec.	Dis.		9	59		II.	Tr.	In.		11	54		I.	Sh.	In.
	6	40		I.	Oc.	Re.		10	52		II.	Sh.	Eg.		12	2		III.	Oc.	Re.
10	0	42		I.	Sh.	In.		11	7		IV.	Sh.	Eg.		12	57		I.	Tr.	In.
	1	32		I.	Tr.	In.		12	44		II.	Tr.	Eg.		14	11		I.	Sh.	Eg.
	2	59		I.	Sh.	Eg.		18	10		IV.	Tr.	In.		15	13		I.*	Tr.	Eg.
	3	48		I.	Tr.	Eg.		18	27	17	I.	Ec.	Dis.		23	58		II.	Sh.	In.
	10	25	18	II.	Ec.	Dis.		19	35		IV.	Tr.	Eg.	30	2	4		II.	Tr.	In.
	14	48		II.	Oc.	Re.		21	37		I.	Oc.	Re.		2	43		II.	Sh.	Eg.
	22	5	27	I.	Ec.	Dis.	20	15	33		I.*	Sh.	In.		4	48		II.	Tr.	Eg.
11	1	9		I.	Oc.	Re.		16	30		I.*	Tr.	In.		9	17	11	I.	Ec.	Dis.
	1	48	59	IV.	Ec.	Dis.		17	49		I.*	Sh.	Eg.		12	34		I.	Oc.	Re.
	3	41	24	IV.	Ec.	Re.														

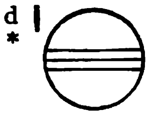
NOTE.—In. denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse.
Oc. denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow; *Visible at Washington.

WASHINGTON MEAN TIME.

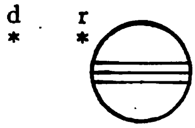
NOVEMBER.

Phases of the Eclipses of the Satellites for an Inverting Telescope.

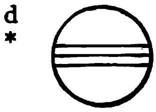
I.



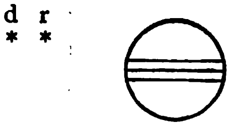
III.



II.



IV.



Configurations at 17ʰ 0ᵐ for an Inverting Telescope.

Day.	West.		East.
1	○ 2· ·1	○	·3 4·
2	·2	○	4· 1· 3·
3	4· ·1	○	·2 3·
4	4· 3·	○	1· 2·
5	4· 3· 2·	○	·1 ●
6	4· ·3 ·2 1·	○	
7	·4 ·3	○	·1 ·2
8	·4 1·	○	2· ·3
9	·4 ·2	○	1· 3·
10	·4 ·1	○	·2 3·
11	3·	○	·4 1· 2·
12	3· 2·	○	·4 ·1 ●
13	·3 ·2 1·	○	·4
14	·3	○	·1 ·2 ·4
15	1·	○	2· ·3 4·
16	2·	○	·1 ·3 4·
17	·1	○	3· 4· ·2 ●
18	○ 3·	○	1· 2· 4·
19	3· 2· ·1	○	4·
20	○ 1· ·3 4· ·2	○	
21	4· ·3	○	·1 ·2
22	4· 1·	○	2· ·3
23	4· 2·	○	·1 ·3
24	·4 1·	○	3· ·2 ●
25	·4	○	3· 1· 2·
26	·4 3· ·1 2·	○	
27	·3 ·2 ·4	○	1·
28	·3	○	·4·2 ·1 ●
29	1·	○	·3 2· ·4
30	2·	○	·1 ·3 ·4

WASHINGTON MEAN TIME.

DECEMBER.

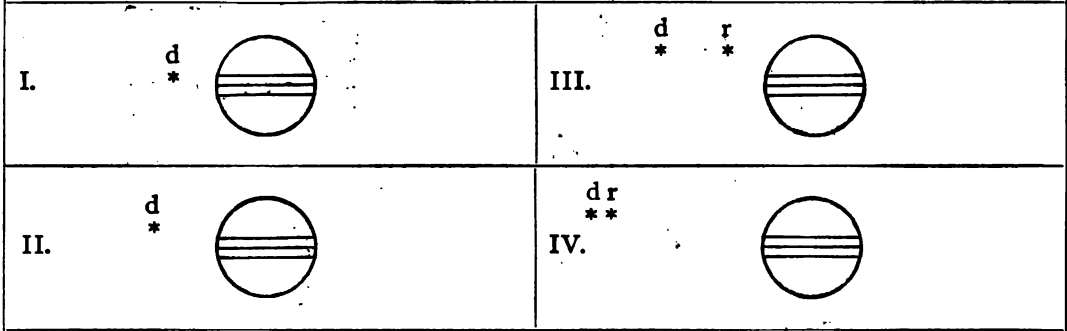
d	h	m	s				d	h	m	s				d	h	m	s			
1	6	23		I.	Sh.	In.	**11**	3	28		I.	Oc.	Re.	**21**	14	56	29	I.*	Ec.	Dis.
	7	27		I.	Tr.	In.		21	13		I.	Sh.	In.		18	21		I.*	Oc.	Re.
	8	39		I.	Sh.	Eg.		22	22		I.	Tr.	In.	**22**	12	3		I.	Sh.	In.
	9	42		I.	Tr.	Eg.		23	29		I.	Sh.	Eg.		13	15		I.	Tr.	In.
	18	8	35	II.*	Ec.	Dis.	**12**	0	37		I.	Tr.	Eg.		14	19		I.*	Sh.	Eg.
	23	0		II.	Oc.	Re.		10	0	54	II.	Ec.	Dis.		15	30		I.*	Tr.	Eg.
2	3	45	27	I.	Ec.	Dis.		15	2		II.*	Oc.	Re.		21	0		IV.	Sh.	In.
	7	3		I.	Oc.	Re.		18	35	10	I.*	Ec.	Dis.		22	40		IV.	Sh.	Eg.
	18	56		III.	Sh.	In.		21	57		I.	Oc.	Re.	**23**	1	52	50	II.	Ec.	Dis.
	21	48		III.	Sh.	Eg.	**13**	13	2	0	III.	Ec.	Dis.		7	1		II.	Oc.	Re.
	23	23		III.	Tr.	In.		15	40	55	III.*	Ec.	Re.		9	24	42	I.	Ec.	Dis.
3	0	51		I.	Sh.	In.		15	41		I.*	Sh.	In.		12	50		I.	Oc.	Re.
	1	56		I.	Tr.	In.		16	51		I.*	Tr.	In.	**24**	6	31		I.	Sh.	In.
	2	3		III.	Tr.	Eg.		17	45		III.*	Oc.	Dis.		6	50		III.	Sh.	In.
	3	7		I.	Sh.	Eg.		17	57		I.*	Sh.	Eg.		7	44		I.	Tr.	In.
	4	11		I.	Tr.	Eg.		19	6		I.	Tr.	Eg.		8	47		I.	Sh.	Eg.
	13	14		II.	Sh.	In.		20	20		III.	Oc.	Re.		9	38		III.	Sh.	Eg.
	15	25		II *	Tr.	In.	**14**	5	5		II.	Sh.	In.		9	59		I.	Tr.	Eg.
	16	0		II.*	Sh.	Eg.		7	25		II.	Tr.	In.		11	53		III.	Tr.	In.
	18	8		II.*	Tr.	Eg.		7	50		II.	Sh.	Eg.		14	22		III.*	Tr.	Eg.
	22	13	48	I.	Ec.	Dis.		10	7		II.	Tr.	Eg.		20	55		II.	Sh.	In.
4	1	32		I.	Oc.	Re.		13	3	27	I.	Ec.	Dis.		23	21		II.	Tr.	In.
	19	19		I.	Sh.	In.		13	59	21	IV.*	Ec.	Dis.		23	40		II.	Sh.	Eg.
	20	25		I.	Tr.	In.		15	13	6	IV.*	Ec.	Re.	**25**	2	3		II.	Tr.	Eg.
	21	36		I.	Sh.	Eg.		16	26		I.*	Oc.	Re.		3	53	0	I.	Ec.	Dis.
	22	41		I.	Tr.	Eg.	**15**	10	9		I.	Sh.	In.		7	18		I.	Oc.	Re.
5	7	26	11	II.	Ec.	Dis.		11	20		I.	Tr.	In.	**26**	0	59		I.	Sh.	In.
	12	21		II.	Oc.	Re.		12	26		I.	Sh.	Eg.		2	13		I.	Tr.	In.
	16	42	3	I.*	Ec.	Dis.		13	35		I.	Tr.	Eg.		3	15		I.	Sh.	Eg.
	20	1		I.	Oc.	Re.		23	17	59	II.	Ec.	Dis.		4	27		I.	Tr.	Eg.
6	2	57		IV.	Sh.	In.	**16**	4	22		II.	Oc.	Re.		15	10	43	II.*	Ec.	Dis.
	4	54		IV.	Sh.	Eg.		7	31	41	I.	Ec.	Dis.		20	20		II.	Oc.	Re.
	9	4	35	III.	Ec.	Dis.		10	55		I.	Oc.	Re.		22	21	13	I.	Ec.	Dis.
	11	44	41	III.	Ec.	Re.	**17**	2	52		III.	Sh.	In.	**27**	1	47		I.	Oc.	Re.
	13	34		III.	Oc.	Dis.		4	38		I.	Sh.	In.		19	27		I.	Sh.	In.
	13	48		I.	Sh.	In.		5	42		III.	Sh.	Eg.		20	41		I.	Tr.	In.
	14	54		I.*	Tr.	In.		5	49		I.	Tr.	In.		20	57	31	III.	Ec.	Dis.
	16	4		I.*	Sh.	Eg.		6	54		I.	Sh.	Eg.		21	44		I.	Sh.	Eg.
	16	12		III.*	Oc.	Re.		7	47		III.	Tr.	In.		22	56		I.	Tr.	Eg.
	17	10		I.*	Tr.	Eg.		8	4		I.	Tr.	Eg.		23	34	4	III.	Ec.	Re.
7	2	31		II.	Sh.	In.		10	19		III.	Tr.	Eg.	**28**	1	59		III.	Oc.	Dis.
	4	45		II.	Tr.	In.		18	22		II.*	Sh.	In.		4	25		III.	Oc.	Re.
	5	16		II.	Sh.	Eg.		20	44		II.	Tr.	In.		10	12		II.	Sh.	In.
	7	28		II.	Tr.	Eg.		21	7		II.	Sh.	Eg.		12	39		II.	Tr.	In.
	11	10	21	I.	Ec.	Dis.		23	26		II.	Tr.	Eg.		12	56		II.	Sh.	Eg.
	14	30		I.*	Oc.	Re.	**18**	1	59	59	I.	Ec.	Dis.		15	20		II.*	Tr.	Eg.
8	8	16		I.	Sh.	In.		5	24		I.	Oc.	Re.		16	49	28	I.*	Ec.	Dis.
	9	24		I.	Tr.	In.		23	6		I.	Sh.	In.		20	15		I.	Oc.	Re.
	10	32		I.	Sh.	Eg.	**19**	0	18		I.	Tr.	In.	**29**	13	56		I.*	Sh.	In.
	11	39		I.	Tr.	Eg.		1	22		I.	Sh.	Eg.		15	10		I.*	Tr.	In.
	20	43	13	II.	Ec.	Dis.		2	33		I.	Tr.	Eg.		16	12		I.*	Sh.	Eg.
9	1	42		II.	Oc.	Re.		12	35	45	II.	Ec.	Dis.		17	24		I.*	Tr.	Eg.
	5	38	36	I.	Ec.	Dis.		17	42		II.*	Oc.	Re.	**30**	4	27	50	II.	Ec.	Dis.
	9	0		I.	Oc.	Re.		20	28	13	I.	Ec.	Dis.		9	38		II.	Oc.	Re.
	22	54		III.	Sh.	In.		23	53		I.	Oc.	Re.		11	17	40	I.	Ec.	Dis.
10	1	45		III.	Sh.	Eg.	**20**	16	59	29	III.*	Ec.	Dis.		14	44		I.*	Oc.	Re.
	2	44		I.	Sh.	In.		17	34		I.*	Sh.	In.	**31**	8	9	34	IV.	Ec.	Dis.
	3	36		III.	Tr.	In.		18	46		I.*	Tr.	In.		8	24		I.	Sh.	In.
	3	53		I.	Tr.	In.		19	37	14	III.	Ec.	Re.		8	52	19	IV.	Ec.	Re.
	5	1		I.	Sh.	Eg.		19	50		I.	Sh.	Eg.		9	38		I.	Tr.	In.
	6	8		I.	Tr.	Eg.		21	1		I.	Tr.	Eg.		10	40		I.	Sh.	Eg.
	6	12		III.	Tr.	Eg.		21	54		III.	Oc.	Dis.		10	47		III.	Sh.	In.
	15	48		II.*	Sh.	In.	**21**	0	24		III.	Oc.	Re.		11	53		I.	Tr.	Eg.
	18	5		II.*	Tr.	In.		7	39		II.	Sh.	In.		13	35		III.*	Sh.	Eg.
	18	33		II.*	Sh.	Eg.		10	3		II.	Tr.	In.		15	56		III.*	Tr.	In.
	20	48		II.	Tr.	Eg.		10	23		II.	Sh.	Eg.		18	20		III.*	Tr.	Eg.
11	0	6	56	I.	Ec.	Dis.		12	45		II.	Tr.	Eg.		23	29		II.	Sh.	In.

NOTE.—In. denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse.
Oc. denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow; * Visible at Washington.

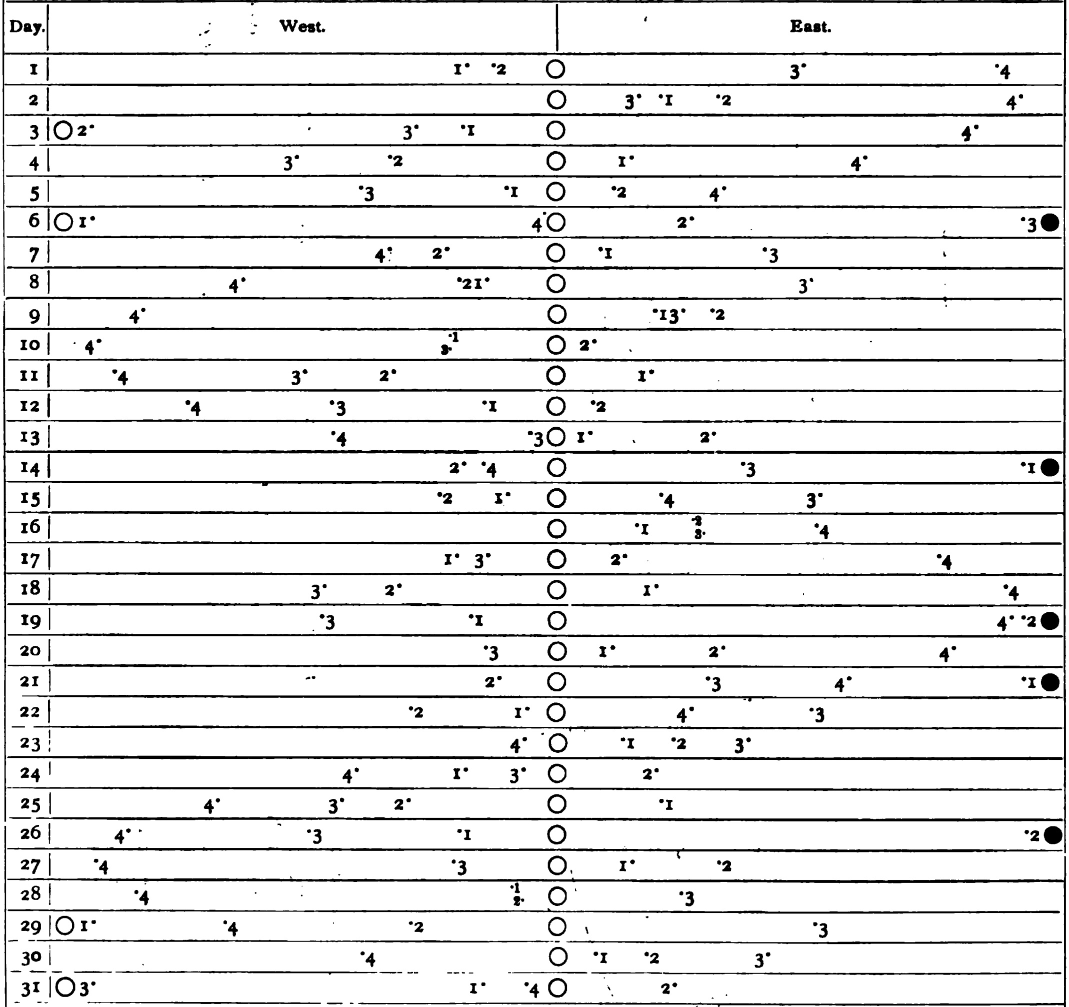
WASHINGTON MEAN TIME.

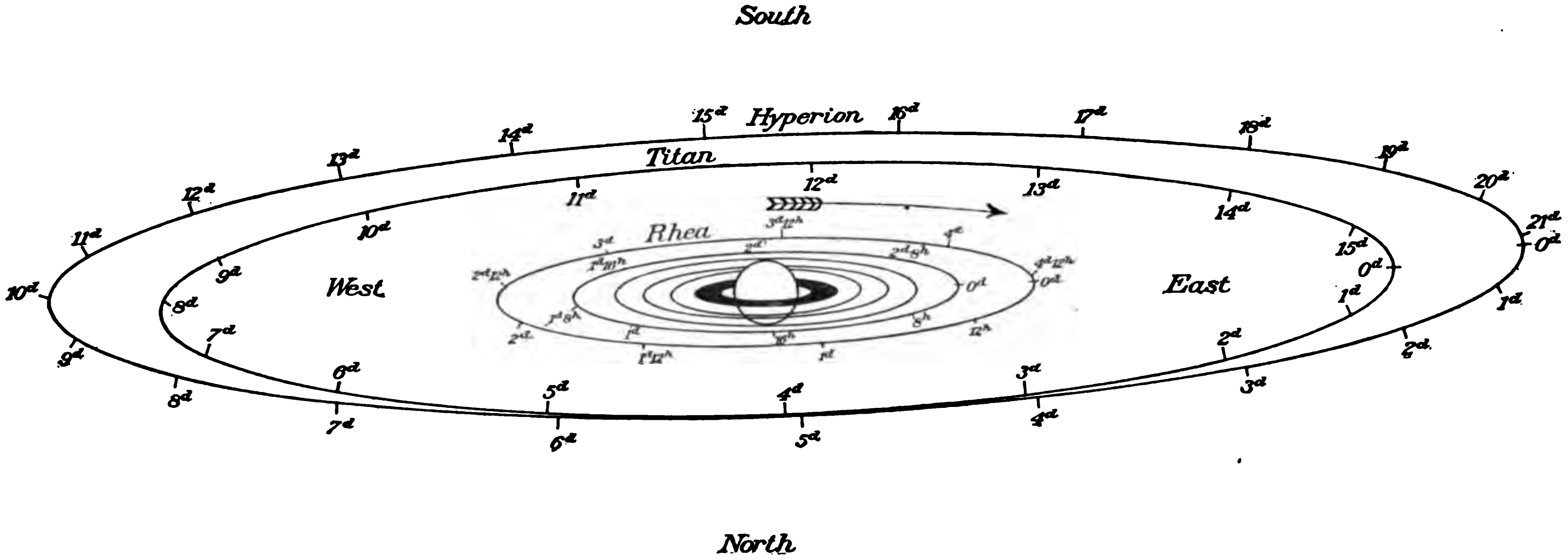
DECEMBER.

Phases of the Eclipses of the Satellites for an Inverting Telescope.



Configurations at 16h 0m for an Inverting Telescope.





Names of the Satellites.	
I.	Mimas.
II.	Enceladus.
III.	Tethys.
IV.	Dione.
V.	Rhea.
VI.	Titan.
VII.	Hyperion.
VIII.	Iapetus.

APPARENT ORBITS OF THE SEVEN INNER SATELLITES OF SATURN,

AT DATE OF OPPOSITION, OCTOBER 13, 1909,

AS SEEN IN AN INVERTING TELESCOPE.

Mean Synodic Periods.	d	h
I.	0	22.6
II.	1	8.9
III.	1	21.3
IV.	2	17.7
V.	4	12.5
VI.	15	23.3
VII.	21	7.6
VIII.	79	22.1

WASHINGTON MEAN TIME OF GREATEST ELONGATION, ETC.

In the diagram on the preceding page, the points of the orbits marked "*o*" are those of the eastern elongation, as seen in an inverting telescope. The times of these elongations may be found from the following tables, and the apparent position of a satellite at any other time may be marked on the diagram by setting off on the proper orbit the elapsed interval in days and hours since the last eastern elongation. The orbits of the five inner Satellites are regarded as circular, and the time of any elongation not given in the tables may be readily found from those given by adding or subtracting the proper multiple of the mean synodic period. Mimas can be seen only within a few hours of each elongation, and the time of every elongation visible at Washington is given. For the three outer Satellites the eccentricity is taken into account, and the times both of the elongations and of the conjunctions are given. The following abbreviations are used in the tables:

E., East Elongation.	I., Inferior Conjunction (south of planet).
W., West Elongation.	S., Superior Conjunction (north of planet).

MIMAS.

Greatest Elongations Visible at Washington.

	d	h		d	h		d	h		d	h		d	h		d	h
Jan.	1	8.0 W.	Aug.	16	11.9 W.	Sept.	16	14.2 W.	Oct.	11	13.3 E.	Nov.	3	15.5 W.	Nov.	29	13.4 E.
	2	6.6 W.		17	10.5 W.		17	12.8 W.		12	11.9 E.		4	14.1 W.		30	12.0 E.
	8	9.7 E.		21	16.2 E.		18	11.4 W.		13	10.5 E.		5	12.7 W.	Dec.	1	10.6 E.
	9	8.4 E.		22	14.8 E.		19	10.0 W.		14	9.2 E.		6	11.3 W.		2	9.2 E.
	10	7.0 E.		23	13.4 E.		20	8.6 W.		15	7.8 E.		7	9.9 W.		3	7.8 E.
	16	10.0 W.		24	12.0 E.		22	17.1 E.		16	6.4 E.		8	8.5 W.		4	6.4 E.
	17	8.6 W.		25	10.7 E.		23	15.7 E.		17	16.4 W.		9	7.2 W.		8	12.2 W.
	. . . .			29	16.5 W.		24	14.3 E.		18	15.0 W.		10	5.8 W.		9	10.9 W.
July	20	15.3 E.		30	15.1 W.		25	12.9 E.		19	13.6 W.		12	14.2 E.		10	9.5 W.
	21	13.9 E.		31	13.8 W.		26	11.5 E.		20	12.3 W.		13	12.9 E.		11	8.1 W.
	22	12.5 E.	Sept.	1	12.4 W.		27	10.1 E.		21	10.9 W.		14	11.5 E.		12	6.7 W.
	28	15.6 W.		2	11.0 W.		28	8.7 E.		22	9.5 W.		15	10.1 E.		16	12.5 E.
	29	14.2 W.		3	9.6 W.		29	7.3 E.		23	8.1 W.		16	8.7 E.		17	11.1 E.
	30	12.8 W.		6	16.6 E.	Oct.	1	16.0 W.		24	6.7 W.		17	7.3 E.		18	9.8 E.
	31	11.4 W.		7	15.2 E.		2	14.6 W.		25	16.5 E.		18	5.9 E.		19	8.4 E.
Aug.	5	15.8 E.		8	13.9 E.		3	13.2 W.		26	15.2 E.		20	14.6 W.		20	7.0 E.
	6	14.4 E.		9	12.5 E.		4	11.8 W.		27	13.8 E.		21	13.2 W.		21	5.6 E.
	7	13.0 E.		10	11.1 E.		5	10.4 W.		28	12.4 E.		22	11.8 W.		25	11.4 W.
	8	11.6 E.		11	9.7 E.		6	9.1 W.		29	11.0 E.		23	10.4 W.		26	10.0 W.
	13	16.1 W.		12	8.3 E.		7	7.7 W.		30	9.6 E.		24	9.0 W.		27	8.6 W.
	14	14.7 W.		14	17.0 W.		9	16.1 E.		31	8.2 E.		25	7.6 W.		28	7.2 W.
	15	13.3 W.		15	15.6 W.		10	14.7 E.	Nov.	1	6.8 E.		26	6.2 W.		29	5.8 W.

ENCELADUS.

	d	h		d	h		d	h		d	h		d	h		d	h
Jan.	1	0.1 E.	Jan.	14	17.0 E.	July	7	18.9 E.	July	21	11.8 E.	Aug.	4	4.6 E.	Aug.	17	21.4 E.
	2	9.0 E.		16	1.9 E.		9	3.8 E.		22	20.7 E.		5	13.5 E.		19	6.3 E.
	3	17.9 E.		17	10.8 E.		10	12.7 E.		24	5.6 E.		6	22.4 E.		20	15.2 E.
	5	2.8 E.		18	19.7 E.		11	21.6 E.		25	14.4 E.		8	7.3 E.		22	0.1 E.
	6	11.7 E.		20	4.6 E.		13	6.5 E.		26	23.3 E.		9	16.2 E.		23	9.0 E.
	7	20.6 E.		. . . .			14	15.4 E.		28	8.2 E.		11	1.0 E.		24	17.8 E.
	9	5.5 E.	July	2	7.4 E.		16	0.3 E.		29	17.1 E.		12	9.9 E.		26	2.7 E.
	10	14.3 E.		3	16.3 E.		17	9.1 E.		31	2.0 E.		13	18.8 E.		27	11.6 E.
	11	23.2 E.		5	1.2 E.		18	18.0 E.	Aug.	1	10.9 E.		15	3.7 E.		28	20.5 E.
	13	8.1 E.		6	10.0 E.		20	2.9 E.		2	19.7 E.		16	12.6 E.		30	5.4 E.

WASHINGTON MEAN TIME OF GREATEST ELONGATION.

ENCELADUS—(*Concluded*).

	d	h		d	h		d	h		d	h		d	h		d	h
Aug.	31	14.2 E.	Sept.	21	3.4 E.	Oct.	11	16.5 E.	Nov.	1	5.7 E.	Nov.	21	18.9 E.	Dec.	12	8.1 E.
Sept.	1	23.1 E.		22	12.3 E.		13	1.4 E.		2	14.6 E.		23	3.8 E.		13	17.0 E.
	3	8.0 E.		23	21.2 E.		14	10.3 E.		3	23.5 E.		24	12.7 E.		15	1.9 E.
	4	16.8 E.		25	6.0 E.		15	19.2 E.		5	8.3 E.		25	21.6 E.		16	10.8 E.
	6	1.7 E.		26	14.9 E.		17	4.0 E.		6	17.2 E.		27	6.4 E.		17	19.7 E.
	7	10.6 E.		27	23.8 E.		18	12.9 E.		8	2.1 E.		28	15.3 E.		19	4.6 E.
	8	19.5 E.		29	8.7 E.		19	21.8 E.		9	11.0 E.		30	0.2 E.		20	13.5 E.
	10	4.4 E.		30	17.5 E.		21	6.7 E.		10	19.9 E.	Dec.	1	9.1 E.		21	22.3 E.
	11	13.2 E.	Oct.	2	2.4 E.		22	15.5 E.		12	4.7 E.		2	18.0 E.		23	7.2 E.
	12	22.1 E.		3	11.3 E.		24	0.4 E.		13	13.6 E.		4	2.8 E.		24	16.1 E.
	14	7.0 E.		4	20.2 E.		25	9.3 E.		14	22.5 E.		5	11.7 E.		26	1.0 E.
	15	15.9 E.		6	5.0 E.		26	18.2 E.		16	7.4 E.		6	20.6 E.		27	9.9 E.
	17	0.8 E.		7	13.9 E.		28	3.1 E.		17	16.3 E.		8	5.5 E.		28	18.8 E.
	18	9.6 E.		8	22.8 E.		29	11.9 E.		19	1.2 E.		9	14.4 E.		30	3.7 E.
	19	18.5 E.		10	7.7 E.		30	20.8 E.		20	10.0 E.		10	23.3 E.		31	12.6 E.

TETHYS.

	d	h		d	h		d	h		d	h		d	h		d	h
Jan.	1	21.9 E.	July	6	0.2 E.	Aug.	10	21.0 E.	Sept.	15	17.6 E.	Oct.	21	14.2 E.	Nov.	26	10.8 E.
	3	19.2 E.		7	21.5 E.		12	18.3 E.		17	14.9 E.		23	11.4 E.		28	8.1 E.
	5	16.5 E.		9	18.8 E.		14	15.6 E.		19	12.2 E.		25	8.7 E.		30	5.4 E.
	7	13.9 E.		11	16.1 E.		16	12.9 E.		21	9.5 E.		27	6.0 E.	Dec.	2	2.7 E.
	9	11.2 E.		13	13.4 E.		18	10.2 E.		23	6.8 E.		29	3.3 E.		4	0.0 E.
	11	8.5 E.		15	10.7 E.		20	7.5 E.		25	4.1 E.		31	0.6 E.		5	21.3 E.
	13	5.8 E.		17	8.0 E.		22	4.8 E.		27	1.4 E.	Nov.	1	21.9 E.		7	18.6 E.
	15	3.1 E.		19	5.3 E.		24	2.1 E.		28	22.7 E.		3	19.2 E.		9	15.9 E.
	17	0.5 E.		21	2.6 E.		25	23.4 E.		30	20.0 E.		5	16.5 E.		11	13.2 E.
	18	21.8 E.		22	23.9 E.		27	20.7 E.	Oct.	2	17.2 E.		7	13.8 E.		13	10.5 E.
	20	19.1 E.		24	21.3 E.		29	18.0 E.		4	14.5 E.		9	11.1 E.		15	7.8 E.
	22	16.5 E.		26	18.6 E.		31	15.3 E.		6	11.8 E.		11	8.4 E.		17	5.1 E.
	24	13.8 E.		28	15.9 E.	Sept.	2	12.6 E.		8	9.1 E.		13	5.7 E.		19	2.4 E.
	26	11.1 E.		30	13.2 E.		4	9.9 E.		10	6.4 E.		15	3.0 E.		20	23.7 E.
	. . . .		Aug.	1	10.5 E.		6	7.2 E.		12	3.7 E.		17	0.3 E.		22	21.0 E.
June	28	10.9 E.		3	7.8 E.		8	4.5 E.		14	1.0 E.		18	21.6 E.		24	18.4 E.
	30	8.2 E.		5	5.1 E.		10	1.8 E.		15	22.3 E.		20	18.9 E.		26	15.7 E.
July	2	5.5 E.		7	2.4 E.		11	23.0 E.		17	19.6 E.		22	16.2 E.		28	13.0 E.
	4	2.8 E.		8	23.7 E.		13	20.3 E.		19	16.9 E.		24	13.5 E.		30	10.3 E.

DIONE.

	d	h		d	h		d	h		d	h		d	h		d	h
Jan.	1	20.8 E.	July	9	20.2 E.	Aug.	14	10.1 E.	Sept.	18	23.7 E.	Oct.	24	13.2 E.	Nov.	29	2.8 E.
	4	14.5 E.		12	13.9 E.		17	3.8 E.		21	17.4 E.		27	6.9 E.	Dec.	1	20.5 E.
	7	8.2 E.		15	7.6 E.		19	21.5 E.		24	11.1 E.		30	0.5 E.		4	14.2 E.
	10	1.9 E.		18	1.3 E.		22	15.1 E.		27	4.7 E.	Nov.	1	18.2 E.		7	7.8 E.
	12	19.6 E.		20	19.0 E.		25	8.8 E.		29	22.4 E.		4	11.8 E.		10	1.5 E.
	15	13.4 E.		23	12.7 E.		28	2.5 E.	Oct.	2	16.0 E.		7	5.5 E.		12	19.2 E.
	18	7.1 E.		26	6.4 E.		30	20.2 E.		5	9.7 E.		9	23.1 E.		15	12.9 E.
	21	0.8 E.		29	0.1 E.	Sept.	2	13.8 E.		8	3.3 E.		12	16.8 E.		18	6.6 E.
	23	18.5 E.		31	17.7 E.		5	7.5 E.		10	21.0 E.		15	10.5 E.		21	0.3 E.
	26	12.2 E.	Aug.	3	11.4 E.		8	1.1 E.		13	14.6 E.		18	4.1 E.		23	18.0 E.
	. . . .			6	5.1 E.		10	18.8 E.		16	8.3 E.		20	21.8 E.		26	11.6 E.
July	4	8.8 E.		8	22.8 E.		13	12.4 E.		19	1.9 E.		23	15.4 E.		29	5.3 E.
	7	2.5 E.		11	16.5 E.		16	6.1 E.		21	19.6 E.		26	9.1 E.		31	23.0 E.

RHEA.

	d	h			d	h	
Jan.	1	11.5	E.	Sept.	25	4.9	E.
	6	0.0	E.		29	17.2	E.
	10	12.5	E.	Oct.	4	5.6	E.
	15	1.0	E.		8	17.9	E.
	. . . .				13	6.2	E.
July	10	10.4	E.		17	18.5	E.
	14	22.8	E.		22	6.8	E.
	19	11.2	E.		26	19.2	E.
	23	23.6	E.		31	7.5	E.
	28	12.1	E.	Nov.	4	19.8	E.
Aug.	2	0.5	E.		9	8.2	E.
	6	12.9	E.		13	20.5	E.
	11	1.4	E.		18	8.9	E.
	15	13.8	E.		22	21.2	E.
	20	2 1	E.		27	9.6	E.
	24	14.5	E.	Dec.	1	22.0	E.
	29	2.9	E.		6	10.4	E.
Sept.	2	15.2	E.		10	22.8	E.
	7	3.6	E.		15	11.2	E.
	11	15.9	E.		19	23.6	E.
	16	4.3	E.		24	12.0	E.
	20	16.6	E.		29	0.5	E.

TITAN.

	d	h			d	h	
Jan.	1	12.4	S.	Oct.	8	12.1	I.
	5	15.4	E.		12	7.9	W.
	9	19.1	I.		16	3.8	S.
	13	15.9	W.		20	6.7	E.
	. . . . .				24	9.5	I.
Aug.	1	17.3	E.		28	5.4	W.
	5	20.4	I.	Nov.	1	1.3	S.
	9	16.4	W.		5	4.2	E.
	13	12.7	S.		9	7.1	I.
	17	15.9	E.		13	3.0	W.
	21	18.8	I.		16	23.0	S.
	25	14.8	W.		21	2.0	E.
	29	10 9	S.		25	5.0	I.
Sept.	2	14.0	E.		29	1.0	W.
	6	16.9	I.	Dec.	2	21.0	S.
	10	12.7	W.		7	0.1	E.
	14	8.8	S.		11	3.2	I.
	18	11.8	E.		14	23.4	W.
	22	14.6	I.		18	19.5	S.
	26	10.4	W.		22	22.6	E.
	30	6.4	S.		27	1.9	I.
Oct.	4	9.3	E.		30	22.2	W.

HYPERION.

	d			d	
Jan.	5.5	E.	Sept.	8 8	W.
	11.7	I.		13.6	S.
	16.2	W.		19.8	E.
	20.7	S.		25.5	I.
	27.0	E.		30.0	W.
Feb.	2.2	I.	Oct.	4.8	S.
	6.6	W.		11.0	E.
	. . .			16.7	I.
June	26.6	E.		21.1	W.
July	2.5	I.		25.9	S.
	7.0	W.	Nov.	1.1	E.
	11.8	S.		6.8	I.
	18.0	E.		11.2	W.
	23.9	I.		16.0	S.
	28.3	W.		22.2	E.
Aug.	2.1	S.		27.9	I.
	8.4	E.	Dec.	2.3	W.
	14.1	I.		7.1	S.
	18.6	W.		13.3	E.
	23.4	S.		19.0	I.
	29.6	E.		23.5	W.
Sept.	4.3	I.		28.3	S.

IAPETUS.

	d			d			d			d			d			d	
Jan.	11.2	W.	June	22.6	W.	Aug.	1.0	E.	Sept.	10.0	W.	Oct.	18.4	E.	Nov.	27.2	W.
Feb.	30.9	S.	July	12.1	S.		21.4	I.		29.0	S.	Nov.	7.5	I.	Dec.	16.4	S.

THE APPARENT ELEMENTS OF SATURN'S RINGS.

	a	*b*	*p*	*l*	*l'*	*u*	*u'*
Washington Mean Noon.	Outer Major Axis.	Outer Minor Axis.	Inclination of Northern Semi-minor Axis to Circle of Declination from North to East.	The Elevation of the Earth above the Plane of the Ring.	The Elevation of the Sun above the Plane of the Ring.	Earth's Longitude from Saturn counted on Plane of Ring from the Ring's Ascending Node on—	
						Equator.	Ecliptic.
	″	″	° ′	° ′	° ′	° ′	° ′
Jan. 0	39.57	- 3.57	3 40.8	- 5 10.1	- 7 50.1	57 39.9	15 2.4
20	38.28	3.86	3 34.4	5 47.1	8 7.8	58 42.3	16 4.9
Feb. 9	37.24	4.30	3 24.8	6 37.7	8 25.5	60 15.1	17 37.8
Mar. 1	36.52	4.85	3 12.6	7 37.8	8 43.1	62 10.8	19 33.6
21	36.12	5.47	2 58.7	8 42.7	9 0.7	64 21.4	21 44.3
Apr. 10	36.08	- 6.14	2 43.8	- 9 47.9	- 9 18.3	66 38.6	24 1.5
30	36.37	6.83	2 28.9	10 49.6	9 35.8	68 54.5	26 17.5
May 20	37.00	7.52	2 14.7	11 44.2	9 53.3	71 1.1	28 24.2
June 9	37.93	8.19	2 2.3	12 28.5	10 10.7	72 50.5	30 13.7
29	39.13	8.80	1 52.6	12 59.9	10 28.1	74 15.0	31 38.2
July 19	40.52	- 9.30	1 46.6	- 13 16.4	- 10 45.4	75 7.3	32 30.6
Aug. 8	41.98	9.64	1 44.8	13 16.8	11 2.7	75 22.5	32 45.9
28	43.33	9.76	1 47.5	13 1.3	11 19.9	74 58.9	32 22.4
Sept. 17	44.37	9.63	1 54.2	12 32.3	11 37.0	74 0.7	31 24.3
Oct. 7	44.88	9.27	2 3.5	11 54.9	11 54.1	72 39.2	30 2.8
27	44.76	- 8.75	2 13.4	- 11 16.7	- 12 11.1	71 11.4	28 35.1
Nov. 16	44.00	8.22	2 21.8	10 46.0	12 28.0	69 56.2	27 20.0
Dec. 6	42.80	7.80	2 27.1	10 29.8	12 44.9	69 9.4	26 33.2
26	41.35	7.56	2 28.1	10 31.7	13 1.7	69 0.6	26 24.5
31	40.99	- 7.53	2 27.6	- 10 35.1	- 13 5.8	69 4.7	26 28.6

The factor to be multiplied by *a* and *b* to obtain the axes of—

The inner ellipse of the outer ring = 0.8801, log factor = 9.9445
The outer ellipse of the inner ring = 0.8599, log factor = 9.9344
The inner ellipse of the inner ring = 0.6650, log factor = 9.8228
The inner ellipse of the dusky ring = 0.5486, log factor = 9.7392

Note.—The positive sign of *l* indicates that the visible surface of the ring is the northern one.

DIFFERENTIAL COORDINATES OF PHŒBE FOR 1906.

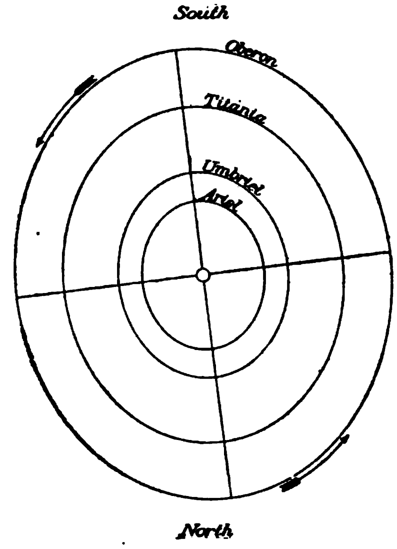
Washington Mean Noon.		$\alpha_{Ph.} - \alpha_{Sat'n.}$	$\delta_{Ph.} - \delta_{Sat'n.}$	Washington Mean Noon.		$\alpha_{Ph.} - \alpha_{Sat'n.}$	$\delta_{Ph.} - \delta_{Sat'n.}$
		m s	′			m s	′
Apr.	30	−1 26.7	−10.2	Sept.	2	−0 23.5	− 0.9
May	5	1 29.3	10.4		7	0 17.8	− 0.3
	10	1 31.3	10.5		12	0 12.0	+ 0.4
	15	1 32.8	10.6		17	0 6.2	1.1
	20	1 33.8	10.6		22	−0 0.4	1.8
	25	−1 34.2	−10.6		27	+0 5.4	+ 2.4
	30	1 34.2	10.5	Oct.	2	0 11.2	3.1
June	4	1 33.6	10.4		7	0 17.0	3.7
	9	1 32.5	10.2		12	0 22.8	4.3
	14	1 31.0	9.9		17	0 28.5	5.0
	19	−1 29.0	− 9.6		22	+0 34.1	+ 5.6
	24	1 26.6	9.2		27	0 39.6	6.1
	29	1 23.9	8.8	Nov.	1	0 45.1	6.7
July	4	1 20.8	8.4		6	0 50.4	7.3
	9	1 17.2	7.9		11	0 55.6	7.8
	14	−1 13.4	− 7.3		16	+1 0.7	+ 8.3
	19	1 9.3	6.8		21	1 5.6	8.8
	24	1 5.0	6.2		26	1 10.4	9.3
	29	1 0.4	5.6	Dec.	1	1 15.0	9.8
Aug.	3	0 55.6	4.9		6	1 19.4	10.2
	8	−0 50.6	− 4.3		11	+1 23.5	+10.6
	13	0 45.4	3.6		16	1 27.5	11.0
	18	0 40.1	3.0		21	1 31.3	11.4
	23	0 34.6	2.3		26	1 34.9	11.8
	28	−0 29.1	− 1.6		31	+1 38.1	+12.1

DIFFERENTIAL COORDINATES OF PHŒBE FOR 1909.

Washington Mean Noon.		$\alpha_{Ph.} - \alpha_{Sat'n.}$	$\delta_{Ph.} - \delta_{Sat'n.}$	Washington Mean Noon.		$\alpha_{Ph.} - \alpha_{Sat'n.}$	$\delta_{Ph.} - \delta_{Sat'n.}$
		m s	′			m s	′
Jan.	0	+0 18.0	+1.6	Aug.	18	+0 45.7	+ 5.3
	5	0 10.8	+0.7		23	0 52.6	6.2
	10	+0 3.6	−0.2		28	0 59.3	7.0
	15	−0 3.6	1.1	Sept.	2	1 5.8	7.8
	20	0 10.7	2.0		7	1 12.1	8.6
	25	−0 17.6	−2.8		12	+1 18.1	+ 9.3
	30	0 24.5	3.7		17	1 24.0	10.1
Feb.	4	0 31.1	4.5		22	1 29.5	10.8
	9	0 37.5	5.3		27	1 34.8	11.5
	14	0 43.7	6.1	Oct.	2	1 39.8	12.2
	19	−0 49.6	−6.8		7	+1 44.5	+12.8
	. .	. .	. .		12	1 48.9	13.4
May	25	1 6.0	8.2		17	1 52.9	13.9
	30	1 1.3	7.6		22	1 56.7	14.4
June	4	0 56.2	7.0		27	2 0.1	14.9
	9	−0 50.8	−6.3	Nov.	1	+2 3.2	+15.3
	14	0 44.9	5.6		6	2 6.0	15.7
	19	0 38.8	4.8		11	2 8.5	16.1
	24	0 32.4	4.0		16	2 10.7	16.4
	29	0 25.7	3.2		21	2 12.6	16.7
July	4	−0 18.8	−2.4		26	+2 14.2	+16.9
	9	0 11.8	1.6	Dec.	1	2 15.5	17.1
	14	−0 4.7	−0.7		6	2 16.5	17.2
	19	+0 2.5	+0.1		11	2 17.2	17.3
	24	0 9.8	1.0		16	2 17.6	17.4
	29	+0 17.1	+1.9		21	+2 17.7	+17.4
Aug.	3	0 24.4	2.7		26	2 17.5	17.3
	8	0 31.6	3.6		31	+2 17.1	+17.3
	13	+0 38.7	+4.5				

Apparent Apsides.

Date.	Position Angle.	App. Distances. Ariel.	App. Distances. Umbriel.
	°	"	"
Apr. 17.	5.3	13.6	18.9
July 6.	6.7	14.2	19.8
Sept. 24.	8.5	13.7	19.1



Apparent Apsides.

Date.	Position Angle.	App. Distances. Titania.	App. Distances. Oberon.
	°	"	"
Apr. 17.	5.3	31.0	41.5
July 6.	6.7	32.5	43.5
Sept. 24.	8.5	31.3	41.8

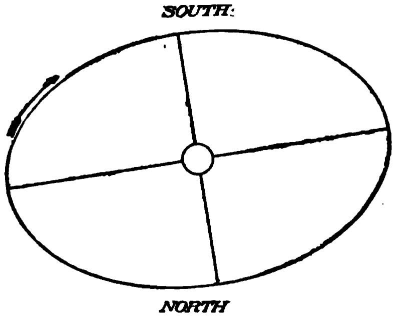
APPARENT ORBITS OF THE SATELLITES OF URANUS AT DATE OF OPPOSITION, JULY 11, 1909, AS SEEN IN AN INVERTING TELESCOPE.

WASHINGTON MEAN TIME OF GREATEST ELONGATION.

ARIEL.		UMBRIEL.		TITANIA.		OBERON.
North.	South.	North.	South.	North.	South.	North and South.
d h	d h	d h	d h	d h	d h	d h
Apr. 21 21.6	Apr. 25 16.4	Apr. 17 16.8	Apr. 19 18.5	Apr. 17 21.2	Apr. 22 5.7	May 9 8.8 S.
29 11.1	May 3 5.8	25 23.7	28 1.4	26 14.2	30 22.6	16 2.4 N.
May 7 0.5	10 19.3	May 4 6.6	May 6 8.3	May 5 7.1	May 9 15.6	22 20.0 S.
14 14.0	18 8.7	12 13.5	14 15.3	14 0.0	18 8.5	29 13.6 N.
22 3.4	25 22.2	20 20.5	22 22.2	22 17.0	27 1.5	June 5 7.3 S.
29 16.9	June 2 11.7	29 3.4	31 5.1	31 10.0	June 4 18.4	12 0.9 N.
June 6 6.4	10 1.1	June 6 10.3	June 8 12.1	June 9 3.0	13 11.4	18 18.6 S.
13 19.9	17 14.6	14 17.3	16 19.0	17 20.0	22 4.5	25 12.2 N.
21 9.4	25 4 1	23 0.2	25 2.0	26 13.0	30 21.5	July 2 5.9 S.
28 22.8	July 2 17.6	July 1 7 2	July 3 8.9	July 5 6.0	July 9 14.6	8 23.6 N.
July 6 12.3	10 7.1	9 14.1	11 15.9	13 23.1	18 7.6	15 17.2 S.
14 1.8	17 20.6	17 21.1	19 22.8	22 16.1	27 0.6	22 10.9 N.
21 15.3	25 10.0	26 4.1	28 5.8	31 9.2	Aug. 4 17.7	29 4.6 S.
29 4.8	Aug. 1 23.5	Aug. 3 11.0	Aug. 5 12.7	Aug. 9 2.2	13 10.7	Aug. 4 22.2 N.
Aug. 5 18.3	9 13.0	11 18.0	13 19.7	17 19.2	22 3.7	11 15.9 S.
13 7.8	17 2.5	20 0.9	22 2.7	26 12.2	30 20.7	18 9.5 N.
20 21.3	24 16.0	28 7.9	30 9.6	Sept. 4 5.2	Sept. 8 13.7	25 3.2 S.
28 10.8	Sept. 1 5.5	Sept. 5 14.9	Sept. 7 16.6	12 22.2	17 6.7	31 20.8 N.
Sept. 5 0.3	8 19.0	13 21.8	15 23.5	21 15.2	25 23.7	Sept. 7 14.5 S.
12 13.8	16 8.5	22 4.8	24 6.5	30 8.2	Oct. 4 16.7	14 8.1 N.
20 3.3	23 22.0	30 11.7	Oct. 2 13.4	Oct. 9 1.1	13 9.6	21 1.7 S.
27 16.8	Oct. 1 11.5	Oct. 8 18.6	10 20.4	17 18.0	22 2.5	27 19.2 N.
Oct. 5 6.2	9 1.0	17 1.6	19 3.3	26 10.9	30 19.4	Oct. 4 12.8 S.
12 19.7	16 14.4	25 8.5	27 10.3	Nov. 4 3.8	Nov. 8 12.3	11 6.4 N.
20 9.2	24 3.9	Nov. 2 15.4	Nov. 4 17.2	12 20.7	17 5.2	17 23.9 S.

	d h		d h
Period of Ariel,	2 12.489	Period of Titania,	8 16.942
Period of Umbriel,	4 3.460	Period of Oberon,	13 11.119

NOTE.—For Ariel only every third elongation is given, and for Umbriel every alternate one. The intermediate ones may be found by adding multiples of the period of the satellite.



Date.	Position Angle of Apsis.	Apparent Distance at Apsis.
	°	″
Jan. 7,	99.4	16.8
Apr. 17,	97.8	16.2
Sept. 20,	103.5	16.1
Dec. 29,	102.5	16.8

APPARENT ORBIT OF THE SATELLITE OF NEPTUNE AT DATE OF OPPOSITION, JANUARY 6, 1909, AS SEEN IN AN INVERTING TELESCOPE.

WASHINGTON MEAN TIME OF GREATEST ELONGATION.

East.			West.			East.			West.			East.			West.		
	d	h		d	h		d	h		d	h		d	h		d	h
Jan.	3	9.0	Jan.	6	7.6	Mar.	26	16.5	Mar.	29	15.0	Oct.	12	9.5	Oct.	15	8.0
	9	6.1		12	4.7	Apr.	1	13.5	Apr.	4	12.1		18	6.5		21	5.0
	15	3.2		18	1.8		7	10.6		10	9.1		24	3.5		27	2.0
	21	0.4		23	22.9		13	7.6		16	6.1		30	0.6	Nov.	1	23.1
	26	21.5		29	20.1		19	4.6		22	3.1	Nov.	4	21.6		7	20.1
Feb.	1	18.6	Feb.	4	17.2		25	1.6		28	0.1		10	18.7		13	17.2
	7	15.8		10	14.3		30	22.6	May	3	21.2		16	15.7		19	14.2
	13	12.9		16	11.4	May	6	19.7		9	18.2		22	12.8		25	11.3
	19	10.0		22	8.5		. . .	. .		. . .	. .		28	9.9	Dec.	1	8.4
	25	7.1		28	5.6	Sept.	13	0.5	Sept.	15	23.1	Dec.	4	7.0		7	5.5
Mar.	3	4.2	Mar.	6	2.7		18	21.5		21	20.0		10	4.1		13	2.6
	9	1.3		11	23.8		24	18.5		27	17.0		16	1.2		18	23.7
	14	22.4		17	20.9		30	15.5	Oct.	3	14.0		21	22.3		24	20.8
	20	19.4		23	18.0	Oct.	6	12.5		9	11.0		27	19.4		30	18.0

The above times are the instants of each passage of the satellite through the apsis of its apparent orbit. The position of the satellite at any other time may be found by measuring around the orbit from the apsis last passed through, bearing in mind that the radius vector of the satellite describes equal areas in equal times.

The period of the satellite of Neptune is $5^{d}\,21^{h}.044$.

NOTE.—In the preceding diagrams the central circle represents the planet and is on the same scale as the orbits.

WASHINGTON MEAN TIME.

PLANETARY CONFIGURATIONS.

	d	h	m			°	′
Jan.	1	11	–	☌ ☿ ♅	.... ☿ −	1	40
	2	13	–	⊕	in Perihelion.		
	5	20	38	☌ ♆ ☾	.... ♆ −	2	33
	5	22	–	☍ ♆ ☉			
	7	0	–	☿	Greatest Hel. Lat. S.		
	7	5	–	☌ ♅ ☉			
	10	14	1	☌ ♃ ☾	.... ♃ −	4	11
	17	6	54	☌ ♂ ☾	.... ♂ −	1	32
	19	11	55	☌ ♀ ☾	.... ♀ +	1	17
	20	8	31	☌ ♅ ☾	.... ♅ +	1	33
	22	11	38	☌ ☿ ☾	.... ☿ +	3	36
	25	12	39	☌ ♄ ☾	.... ♄ +	3	1
	26	1	–	☿	in ☊		
	26	10	–	☿	Greatest elong. E.	18	27
	28	14	–	♀	in ☋		
	30	0	–	☌ ♀ ♅	.... ♀ +	0	21
	30	15	–	☿	in Perihelion.		
Feb.	1	9	–	☿	Stationary.		
	2	1	46	☌ ♆ ☾	.... ♆ −	2	31
	6	17	4	☌ ♃ ☾	.... ♃ −	3	53
	9	22	–	☿	Greatest Hel. Lat. N.		
	10	21	–	☌ ☿ ☉	Inferior.		
	12	16	–	♂	in ☋		
	15	3	35	☌ ♂ ☾	.... ♂ +	0	1
	16	21	53	☌ ♅ ☾	.... ♅ +	1	46
	18	11	2	☌ ♀ ☾	.... ♀ +	3	3
	18	12	28	☌ ☿ ☾	.... ☿ +	7	12
	19	0	–	☌ ☿ ♀	.... ♀ +	4	1
	22	2	20	☌ ♄ ☾	.... ♄ +	2	52
	22	22	–	☿	Stationary.		
	28	2	–	☍ ♃ ☉			
Mar.	1	6	24	☌ ♆ ☾	.... ♆ −	2	37
	4	2	–	♀	in Aphelion.		
	5	9	–	☿	in ☋		
	5	16	41	☌ ♃ ☾	.... ♃ −	3	42
	9	2	–	☿	Greatest elong. W.	27	26
	15	15	–	☿	in Aphelion.		
	15	21	55	☌ ♂ ☾	.... ♂ +	1	26
	16	9	10	☌ ♅ ☾	.... ♅ +	2	4
	19	6	27	☌ ☿ ☾	.... ☿ +	3	5
	20	7	52	☌ ♀ ☾	.... ♀ +	3	52
	20	13	–	☉	enters ♈, Spring com.		
	21	18	38	☌ ♄ ☾	.... ♄ +	2	41
	25	6	–	♆	Stationary.		
	26	4	–	☌ ♂ ♅	.... ♂ −	0	18
	26	10	–	♀	Greatest Hel. Lat. S.		
	28	12	22	☌ ♆ ☾	.... ♆ −	2	51
Apr.	1	16	40	☌ ♃ ☾	.... ♃ −	3	45
	2	18	–	☌ ♄ ☉			
	4	1	–	□ ♆ ☉			
Apr.	5	0	–	☿	Greatest Hel. Lat. S.		
	8	23	–	☌ ♀ ♄	.... ♀ +	0	58
	10	20	–	□ ♅ ☉			
	12	17	11	☌ ♅ ☾	.... ♅ +	2	20
	13	4	–	☌ ☿ ♄	.... ☿ +	0	39
	13	13	43	☌ ♂ ☾	.... ♂ +	2	29
	18	11	3	☌ ♄ ☾	.... ♄ +	2	33
	19	5	36	☌ ☿ ☾	.... ☿ +	3	28
	19	5	51	☌ ♀ ☾	.... ♀ +	3	7
	19	10	–	☌ ☿ ♀	.... ☿ +	0	22
	21	6	–	☌ ☿ ☉	Superior.		
	24	0	–	☿	in ☊		
	24	20	45	☌ ♆ ☾	.... ♆ −	3	5
	25	7		♅	Stationary.		
	28	0	–	☌ ♀ ☉	Superior.		
	28	14	–	☿	in Perihelion.		
	28	20	37	☌ ♃ ☾	.... ♃ −	3	59
May	1	7	–	♃	Stationary.		
	8	21	–	☿	Greatest Hel. Lat. N.		
	9	22	38	☌ ♅ ☾	.... ♅ +	2	29
	12	3	19	☌ ♂ ☾	.... ♂ +	2	56
	12	22	–	□ ♂ ☉			
	16	1	32	☌ ♄ ☾	.... ♄ +	2	25
	19	6	26	☌ ♀ ☾	.... ♀ +	1	6
	19	23	–	☿	Greatest elong. E.	22	23
	20	13	27	☌ ☿ ☾	.... ☿ +	1	40
	21	17	–	♀	in ☊		
	22	7	2	☌ ♆ ☾	.... ♆ −	3	13
	26	5	57	☌ ♃ ☾	.... ♃ −	4	13
	26	18	–	□ ♃ ☉			
June	1	8	–	☿	in ☋		
	2	0	–	☿	Stationary.		
	3	–	–	☾	Tot. ec. partly vis. at Wash.		
	6	3	27	☌ ♅ ☾	.... ♅ +	2	29
	6	22	–	☌ ☿ ♀	.... ☿ −	2	11
	9	14	45	☌ ♂ ☾	.... ♂ +	2	33
	11	14	–	☿	in Aphelion.		
	12	13	0	☌ ♄ ☾	.... ♄ +	2	13
	14	6	–	☌ ☿ ☉	Inferior.		
	16	23	5	☌ ☿ ☾	.... ☿ −	4	29
	17	–	–	☉	Cen. ec. vis. as par. at Wash.		
	18	8	50	☌ ♀ ☾	.... ♀ −	1	8
	18	17	46	☌ ♆ ☾	.... ♆ −	3	17
	21	9	–	☉	enters ♋, Summer com.		
	22	13	–	☌ ♀ ♆	.... ♀ +	1	52
	22	19	49	☌ ♃ ☾	.... ♃ −	4	21
	24	11	–	♀	in Perihelion.		
	26	0	–	☿	Stationary.		
July	1	23	–	☿	Greatest Hel. Lat. S.		
	3	9	23	☌ ♅ ☾	.... ♅ +	2	22

WASHINGTON MEAN TIME.

PLANETARY CONFIGURATIONS.

	d	h	m			°	′
July	3	10	–	⊕	in Aphelion.		
	7	12	–	☿	Greatest elong. W.	21	12
	7	22	37	☌ ♂ ☾	. . . . ♂ +	1	21
	9	1	–	☌ ♆ ☉			
	9	21	38	☌ ♄ ☾	. . . . ♄ +	1	54
	11	10	–	☍ ♅ ☉			
	15	3	28	☌ ☿ ☾	. . . . ☿ —	2	48
	15	9	–	□ ♄ ☉			
	16	3	36	☌ ♆ ☾	. . . . ♆ —	3	21
	16	5	–	♀	Greatest Hel. Lat. N.		
	18	12	42	☌ ♀ ☾	. . . . ♀ —	3	5
	19	12	–	♂	Greatest Hel. Lat. S.		
	20	12	31	☌ ♃ ☾	. . . . ♃ —	4	22
	20	23	–	☿	in ☊		
	23	0	–	☌ ☿ ♆	. . . . ☿ +	1	6
	25	14	–	☿	in Perihelion.		
	30	16	55	☌ ♅ ☾	. . . . ♅ +	2	18
Aug.	3	19	–	☌ ☿ ☉	Superior.		
	4	21	–	☿	Greatest Hel. Lat. N.		
	4	23	6	☌ ♂ ☾	. . . . ♂ —	0	13
	5	17	–	♄	Stationary.		
	6	4	37	☌ ♄ ☾	. . . . ♄ +	1	33
	11	14	–	☌ ♀ ♃	. . . . ♀ +	0	12
	12	11	48	☌ ♆ ☾	. . . . ♆ —	3	29
	13	2	–	♂	in Perihelion.		
	16	5	48	☌ ☿ ☾	. . . . ☿ —	3	53
	17	6	28	☌ ♃ ☾	. . . . ♃ —	4	17
	17	19	4	☌ ♀ ☾	. . . . ♀ —	4	14
	22	22	–	♂	Stationary.		
	24	19	–	☌ ☿ ♃	. . . . ☿ —	0	40
	27	1	30	☌ ♅ ☾	. . . . ♅ +	2	22
	28	8	–	☿	in ☋		
Sept.	1	10	31	☌ ♂ ☾	. . . . ♂ —	1	4
	2	11	25	☌ ♄ ☾	. . . . ♄ +	1	14
	7	13	–	☿	in Aphelion.		
	8	18	42	☌ ♆ ☾	. . . . ♆ —	3	43
	10	7	–	♀	in ☋		
	14	0	43	☌ ♃ ☾	. . . . ♃ —	4	10
	16	2	15	☌ ☿ ☾	. . . . ☿ —	7	10
	16	17	–	☿	Greatest elong. E.	26	34
	17	4	1	☌ ♀ ☾	. . . . ♀ —	3	55
	17	21	–	☌ ♃ ☉			
	23	0	–	☉	enters ♎, Autumn com.		
	23	9	55	☌ ♅ ☾	. . . . ♅ +	2	35
	23	17	–	☍ ♂ ☉			
	26	9	–	♅	Stationary.		
	27	22	–	☿	Greatest Hel. Lat. S.		
	28	9	54	☌ ♂ ☾	. . . . ♂ +	0	9
	29	16	–	☿	Stationary.		
	29	18	53	☌ ♄ ☾	. . . . ♄ +	1	8
Oct.	6	1	25	☌ ♆ ☾	. . . . ♆ —	4	0
	10	11	–	□ ♅ ☉			
	11	18	50	☌ ♃ ☾	. . . . ♃ —	4	3
	11	22	–	☌ ☿ ☉	Inferior.		
	12	14	–	□ ♆ ☉			
	13	1	–	☍ ♄ ☉			
	13	4	11	☌ ☿ ☾	. . . . ☿ —	5	50
	14	18	–	♀	in Aphelion.		
	16	23	–	☿	in ☊		
	17	11	32	☌ ♀ ☾	. . . . ♀ —	2	17
	20	8	–	☿	Stationary.		
	20	17	26	☌ ♅ ☾	. . . . ♅ +	2	48
	21	13	–	☿	in Perihelion.		
	22	10	–	♆	Stationary.		
	25	12	58	☌ ♂ ☾	. . . . ♂ +	2	38
	26	0	–	♂	Stationary.		
	27	2	40	☌ ♄ ☾	. . . . ♄ +	1	17
	27	14	–	☿	Greatest elong. W.	18	33
	31	20	–	☿	Greatest Hel. Lat. N.		
Nov.	2	9	11	☌ ♆ ☾	. . . . ♆ —	4	11
	6	3	–	♀	Greatest Hel. Lat. S.		
	8	12	35	☌ ♃ ☾	. . . . ♃ —	3	52
	11	5	19	☌ ☿ ☾	. . . . ☿ —	1	20
	16	11	19	☌ ♀ ☾	. . . . ♀ —	0	6
	17	0	31	☌ ♅ ☾	. . . . ♅ +	3	0
	22	5	2	☌ ♂ ☾	. . . . ♂ +	4	26
	23	8	–	☌ ♀ ♅	. . . . ♀ —	2	33
	23	9	45	☌ ♄ ☾	. . . . ♄ +	1	32
	24	7	–	☿	in ☋		
	26	16	–	☾	Total eclipse vis. at Wash.		
	29	18	14	☌ ♆ ☾	. . . . ♆ —	4	14
Dec.	2	0	–	♀	Greatest elong. E.	47	18
	2	13	–	☌ ☿ ☉	Superior.		
	4	13	–	☿	in Aphelion.		
	6	5	27	☌ ♃ ☾	. . . . ♃ —	3	35
	12	3	–	☉	Partial ec. invis. at Wash.		
	12	14	19	☌ ☿ ☾	. . . . ☿ —	0	3
	13	19	–	♂	in ☊		
	14	8	43	☌ ♅ ☾	. . . . ♅ +	3	4
	15	22	2	☌ ♀ ☾	. . . . ♀ +	2	51
	20	5	–	♄	Stationary.		
	20	6	46	☌ ♂ ☾	. . . . ♂ +	5	0
	20	15	53	☌ ♄ ☾	. . . . ♄ +	1	40
	21	18	–	☉	enters ♑, Winter com.		
	24	21	–	☿	Greatest Hel. Lat. S.		
	27	3	22	☌ ♆ ☾	. . . . ♆ —	4	9
	27	15	–	☌ ☿ ♅	. . . . ☿ —	1	44
	31	2	–	☌ ♂ ♄	. . . . ♂ +	3	12
	31	18	–	⊕	in Perihelion.		

POSITIONS OF OBSERVATORIES.

(*North Latitudes and West Longitudes are Considered Positive.*)

Place.	Latitude.	Reduction to Geocentric Latitude.	Log ρ.	Longitude.	
				From Washington.	From Greenwich.
	° ′ ″	′ ″		h m s	h m s
Abastuman	+41 42 24	− 11 35.5	9.999 351	− 7 59 41	− 2 51 25
Åbo	+60 26 56.8	− 10 2.1	9.998 887	− 6 37 22.20	− 1 29 6.42
Adelaide	−34 55 38.5	+ 10 56.8	9.999 520	+ 9 37 23.92	− 9 14 20.30
Albany (*New Obs.*)	+42 39 12.7	− 11 38.0	9.999 326	− 0 13 9.0	+ 4 55 6.8
Albany (*Old Obs.*)	+42 39 49.5	− 11 38.0	9.999 326	− 0 13 15.79	+ 4 54 59.99
Alfred (*N. Y.*)	+42 15 19.8	− 11 37.0	9.999 337	+ 0 2 51.37	+ 5 11 7.15
Algiers (*Old Obs.*)	+36 44 0	− 11 10.8	9.999 476	− 5 20 32.6	− 0 12 16.8
Algiers (*New Obs.*)	+36 47 50	− 11 11.3	9.999 474	− 5 20 24.33	− 0 12 8.55
Allegheny	+40 27 41.6	− 11 31.3	9.999 383	+ 0 11 47.15	+ 5 20 2.93
Altona	+53 32 45.3	− 11 10.2	9.999 049	− 5 48 2.02	− 0 39 46.24
Amherst	+42 22 17.1	− 11 37.3	9.999 334	− 0 18 11.11	+ 4 50 4.67
Annapolis	+38 58 53.5	− 11 24.5	9.999 420	− 0 2 19.29	+ 5 5 56.49
Ann Arbor	+42 16 48.0	− 11 37.0	9.999 336	+ 0 26 39.41	+ 5 34 55.19
Arequipa (*Harvard*)	−16 22 28.0	+ 6 17.8	9.999 884	− 0 22 4.05	+ 4 46 11.73
Armagh	+54 21 12.7	− 11 4.2	9.999 029	− 4 41 40.4	+ 0 26 35.4
Athens	+37 58 20.7	− 11 18.9	9.999 445	− 6 43 8.70	− 1 34 52.92
Bamberg	+49 53 6.0	− 11 30.7	9.999 141	− 5 51 49.43	− 0 43 33.65
Beloit	+42 30 8.4	− 11 37.6	9.999 331	+ 0 47 51.5	+ 5 56 7.3
Bergen	+60 23 54	− 10 2.7	9.998 888	− 5 29 28.53	− 0 21 12.75
Berkeley	+37 52 23.6	− 11 18.3	9.999 448	+ 3 0 46.94	+ 8 9 2.72
Berlin	+52 30 16.7	− 11 17.1	9.999 075	− 6 1 50.63	− 0 53 34.85
Berlin (*Urania*)	+52 31 30.7	− 11 17.0	9.999 075	− 6 1 43.23	− 0 53 27.45
Berne	+46 57 8.7	− 11 39.0	9.999 216	− 5 38 1.51	− 0 29 45.73
Besançon	+47 14 59.0	− 11 38.5	9.999 208	− 5 32 12.95	− 0 23 57.17
Bethlehem	+40 36 23.1	− 11 31.9	9.999 379	− 0 6 43.93	+ 5 1 31.85
Birr Castle	+53 5 47.0	− 11 13.3	9.999 060	− 4 36 34.9	+ 0 31 40.9
Bogota	+ 4 36 15.4	− 1 51.5	9.999 991	− 0 11 21.58	+ 4 56 54.20
Bologna	+44 29 54	− 11 40.3	9.999 279	− 5 53 40.7	− 0 45 24.9
Bombay	+18 53 45	− 7 8.1	9.999 847	− 9 59 31.52	− 4 51 15.74
Bonn	+50 43 45.0	− 11 26.9	9.999 120	− 5 36 39.00	− 0 28 23.22
Bordeaux	+44 50 7.2	− 11 40.4	9.999 271	− 5 6 10.24	+ 0 2 5.54
Boston (*University*)	+42 21 32.5	− 11 37.2	9.999 334	− 0 24 0.8	+ 4 44 15.0
Bothkamp	+54 12 9.6	− 11 5.3	9.999 033	− 5 48 47.0	− 0 40 31.2
Breslau	+51 6 55.8	− 11 25.0	9.999 110	− 6 16 24.57	− 1 8 8.79
Brisbane	−27 28 0.0	+ 9 32.2	9.999 689	+ 8 39 37.82	−10 12 6.40
Brussels (*Uccle*)	+50 47 53	− 11 26.6	9.999 118	− 5 25 42.7	− 0 17 26.9
Brussels (*Old Obs.*)	+50 51 10.7	− 11 26.3	9.999 117	− 5 25 44.51	− 0 17 28.73
Budapest	+47 29 34.7	− 11 38.0	9.999 202	− 6 24 31.1	− 1 16 15.3
Cairo	+30 4 38.2	− 10 6.5	9.999 632	− 7 13 24.69	− 2 5 8.91
Cambridge (*England*)	+52 12 51.6	− 11 18.9	9.999 082	− 5 8 38.53	− 0 0 22.75
Cambridge (*Mass.*)	+42 22 47.6	− 11 37.3	9.999 334	− 0 23 44.73	+ 4 44 31.05
Cape of Good Hope	−33 56 3.6	+ 10 48.0	9.999 543	− 6 22 10.54	− 1 13 54.76
Catania	+37 30 13.3	− 11 16.0	9.999 457	− 6 8 36	− 1 0 20
Chapultepec	+19 25 17.5	− 7 18.2	9.999 838	+ 1 28 22.52	+ 6 36 38.30
Charkow	+50 0 9.6	− 11 30.2	9.999 138	− 7 33 11.55	− 2 24 55.77

POSITIONS OF OBSERVATORIES.

(*North Latitudes and West Longitudes are Considered Positive.*)

Place.	Latitude.	Reduction to Geocentric Latitude.	Log ρ.	Longitude.	
				From Washington.	From Greenwich.
	° ′ ″	′ ″		h m s	h m s
Charlottesville	+38 2 1.2	− 11 19.3	9.999 444	+ 0 5 49.44	+ 5 14 5.22
Chicago (*Old Obs.*)	+41 50 1.0	− 11 35.9	9.999 348	+ 0 42 11.06	+ 5 50 26.84
Christiania	+59 54 44.0	− 10 8.7	9.998 899	− 5 51 9.30	− 0 42 53.52
Cincinnati (*New Obs.*)	+39 8 19.5	− 11 25.4	9.999 416	+ 0 29 25.62	+ 5 37 41.40
Cincinnati (*Old Obs.*)	+39 6 26.5	− 11 25.2	9.999 417	+ 0 29 43.22	+ 5 37 59.00
Clinton	+43 3 17.0	− 11 38.7	9.999 316	− 0 6 38.33	+ 5 1 37.45
Coimbra	+40 12 24.5	− 11 30.3	9.999 389	− 4 34 32.7	+ 0 33 43.1
Columbia (*Missouri*)	+38 56 51.7	− 11 24.4	9.999 421	+ 1 1 2.55	+ 6 9 18.33
Copenhagen	+55 41 12.9	− 10 53.1	9.998 997	− 5 58 34.48	− 0 50 18.70
Cordoba	−31 25 15.2	+ 10 22.2	9.999 602	− 0 51 27.56	+ 4 16 48.22
Cracow	+50 3 52.0	− 11 29.9	9.999 137	− 6 28 6.06	− 1 19 50.28
Crowborough	+51 3 14	− 11 25.4	9.999 112	− 5 8 54	− 0 0 38
Dantzig	+54 21 18.0	− 11 4.1	9.999 029	− 6 22 55.4	− 1 14 39.6
Denver	+39 40 36.4	− 11 27.9	9.999 402	+ 1 51 31.85	+ 6 59 47.63
Dorpat	+58 22 47.1	− 10 26.4	9.998 934	− 6 55 9.07	− 1 46 53.29
Dresden	+51 2 16.8	− 11 25.4	9.999 112	− 6 3 10.63	− 0 54 54.85
Dublin	+53 23 13.1	− 11 11.3	9.999 053	− 4 42 54.7	+ 0 25 21.1
Dun Echt	+57 9 36	− 10 39.2	9.998 962	− 4 58 35.8	+ 0 9 40.0
Durham	+54 46 6.2	− 11 0.9	9.999 019	− 5 1 56.03	+ 0 6 19.75
Düsseldorf	+51 12 25.0	− 11 24.6	9.999 108	− 5 35 20.8	− 0 27 5.0
Edinburgh (*Calton Hill*)	+55 57 23.2	− 10 50.7	9.998 991	− 4 55 32.7	+ 0 12 43.1
Edinburgh (*Royal Obs.*)	+55 55 28.0	− 10 50.9	9.998 991	− 4 55 31.6	+ 0 12 44.2
Evanston (*Dearborn*)	+42 3 33.4	− 11 36.5	9.999 342	+ 0 42 26.5	+ 5 50 42.3
Flagstaff (*Lowell*)	+35 12 30.4	− 10 59.2	9.999 513	+ 2 18 28.79	+ 7 26 44.57
Florence (*Reale Museo*)	+43 46 4.1	− 11 39.7	9.999 298	− 5 53 17.3	− 0 45 1.5
Florence (*Arcetri*)	+43 45 14.6	− 11 39.7	9.999 298	− 5 53 17.12	− 0 45 1.34
Geneva	+46 11 58.8	− 11 39.9	9.999 236	− 5 32 52.49	− 0 24 36.71
Genoa	+44 25 9.3	− 11 40.2	9.999 281	− 5 43 57.11	− 0 35 41.33
Georgetown	+38 54 26.7	− 11 24.2	9.999 422	+ 0 0 2.48	+ 5 8 18.26
Glasgow (*Missouri*)	+39 13 45.6	− 11 25.8	9.999 414	+ 1 3 2.30	+ 6 11 18.08
Glasgow (*Scotland*)	+55 52 42.8	− 10 51.5	9.998 993	− 4 51 5.23	+ 0 17 10.55
Gohlis	+51 21 35.0	− 11 23.7	9.999 104	− 5 57 45.43	− 0 49 29.65
Gotha (*Old Obs.*)	+50 56 5.2	− 11 26.0	9.999 114	− 5 51 10.88	− 0 42 55.10
Gotha	+50 56 37.9	− 11 25.9	9.999 114	− 5 51 6.27	− 0 42 50.49
Göttingen	+51 31 47.9	− 11 22.8	9.999 100	− 5 48 2.07	− 0 39 46.29
Graz	+47 4 37.2	− 11 38.8	9.999 213	− 6 10 4	− 1 1 48
Greenwich	+51 28 38.1	− 11 23.1	9.999 101	− 5 8 15.78	0 0 0.00
Grignon	+47 33 42	− 11 37.8	9.999 201	− 5 25 54	− 0 17 38
Hamburg	+53 33 7.0	− 11 10.1	9.999 049	− 5 48 9.6	− 0 39 53.8
Hanover	+43 42 15.3	− 11 39.6	9.999 300	− 0 19 7.87	+ 4 49 7.91
Harrow	+51 34 47.1	− 11 22.6	9.999 098	− 5 6 55.92	+ 0 1 19.86
Hastings-on-Hudson	+40 59 25	− 11 33.2	9.999 369	− 0 12 46.33	+ 4 55 29.45
Haverford	+40 0 40.1	− 11 29.4	9.999 394	− 0 7 3.08	+ 5 1 12.70
Heidelberg	+49 24 35	− 11 32.5	9.999 153	− 5 43 4.3	− 0 34 48.5
Helsingfors	+60 9 42.6	− 10 5.6	9.998 893	− 6 48 4.93	− 1 39 49.15

POSITIONS OF OBSERVATORIES.

(*North Latitudes and West Longitudes are Considered Positive.*)

Place.	Latitude.	Reduction to Geocentric Latitude.	Log ρ.	Longitude.	
				From Washington.	From Greenwich.
	° ′ ″	′ ″		h m s	h m s
Hereny . . .	+47 15 47.4	– 11 38.4	9.999 208	– 6 14 40.5	– 1 6 24.7
Hongkong . . .	+22 18 13.4	– 8 10.7	9.999 789	+11 15 2.36	– 7 36 41.86
Hudson . . .	+41 14 42.6	– 11 34.1	9.999 363	+ 0 17 25.5	+ 5 25 41.3
Jamaica . . .	+18 24 51	– 6 58.7	9.999 854	+ 0 3 13.70	+ 5 11 29.48
Jena (*University*) .	+50 55 34.9	– 11 26.0	9.999 115	– 5 54 36.05	– 0 46 20.27
Kalocsa . . .	+46 31 41.7	– 11 39.6	9.999 227	– 6 24 10.12	– 1 15 54.34
Karlsruhe . . .	+49 0 29.6	– 11 33.9	9.999 163	– 5 41 52.2	– 0 33 36.4
Kasan	+55 47 24.3	– 10 52.2	9.998 995	– 8 24 44.82	– 3 16 29.04
Kew	+51 28 6	– 11 23.2	9.999 101	– 5 7 0.7	+ 0 1 15.1
Kiel	+54 20 28.5	– 11 4.2	9.999 030	– 5 48 51.42	– 0 40 35.64
Kiew	+50 27 10.5	– 11 28.2	9.999 127	– 7 10 16.42	– 2 2 0.64
Kis Kartal . . .	+47 41 54.8	– 11 37.5	9.999 197	– 6 26 27.5	– 1 18 11.7
Königsberg . . .	+54 42 50.4	– 11 1.3	9.999 021	– 6 30 14.82	– 1 21 59.04
Kremsmünster . .	+48 3 23.1	– 11 36.7	9.999 188	– 6 4 47.37	– 0 56 31.59
La Plata . . .	–34 54 30.3	+ 10 56.7	9.999 520	– 1 16 38.8	+ 3 51 37.0
Leiden . . .	+52 9 20.0	– 11 19.3	9.999 084	– 5 26 11.95	– 0 17 56.17
Leipzig . . .	+51 20 5.9	– 11 23.9	9.999 104	– 5 57 49.76	– 0 49 33.98
Liege (*Cointe, Ougrée*).	+50 37 7	– 11 27.5	9.999 123	– 5 30 31.0	– 0 22 15.2
Lisbon (*Marine Obs.*).	+38 42 17.6	– 11 23.3	9.999 427	– 4 31 42.20	+ 0 36 33.58
Lisbon (*Royal Obs.*) .	+38 42 31.3	– 11 23.1	9.999 427	– 4 31 31.10	+ 0 36 44.68
Liverpool . . .	+53 24 4.8	– 11 11.2	9.999 053	– 4 55 58.45	+ 0 12 17.33
Lübec . . .	+53 51 31.1	– 11 7.9	9.999 042	– 5 51 1.5	– 0 42 45.7
Lund . . .	+55 41 51.6	– 10 53.0	9.998 997	– 6 1 0.79	– 0 52 45.01
Lussinpiccolo (*Manora*)	+44 32 11.0	– 11 40.3	9.999 278	– 6 6 8.19	– 0 57 52.41
Lyons . . .	+45 41 41.0	– 11 40.3	9.999 248	– 5 27 24.33	– 0 19 8.55
Madison . . .	+43 4 36.8	– 11 38.7	9.999 316	+ 0 49 22.15	+ 5 57 37.93
Madras . . .	+13 4 8.0	– 5 7.6	9.999 925	–10 29 14.90	– 5 20 59.12
Madrid . . .	+40 24 29.7	– 11 31.1	9.999 384	– 4 53 30.66	+ 0 14 45.12
Manila . . .	+14 35 25	– 5 40.5	9.999 907	+10 47 54	– 8 3 50
Mannheim . . .	+49 29 11.0	– 11 32.2	9.999 151	– 5 42 6.23	– 0 33 50.45
Marburg . . .	+50 48 46.9	– 11 26.5	9.999 118	– 5 43 20.7	– 0 35 4.9
Markree . . .	+54 10 31.8	– 11 5.5	9.999 034	– 4 34 27.4	+ 0 33 48.4
Marseilles . . .	+43 18 17.5	– 11 39.1	9.999 310	– 5 29 50.37	– 0 21 34.59
Mauritius . . .	–20 5 39	+ 7 30.8	9.999 828	– 8 58 28.4	– 3 50 12.6
Melbourne . . .	–37 49 53.4	+ 11 18.1	9.999 449	+ 9 11 50.2	– 9 39 54.0
Meudon . . .	+48 48 18	– 11 34.6	9.999 169	– 5 17 11.4	– 0 8 55.6
Mexico . . .	+19 26 1.3	– 7 18.4	9.999 838	+ 1 28 10.95	+ 6 36 26.73
Middletown (*Conn.*) .	+41 33 16.0	– 11 35.1	9.999 355	– 0 17 38.60	+ 4 50 37.18
Milan . . .	+45 27 59.3	– 11 40.4	9.999 254	– 5 45 1.70	– 0 36 45.92
Modena . . .	+44 38 52.8	– 11 40.4	9.999 275	– 5 51 58.7	– 0 43 42.9
Moncalieri . . .	+44 59 51	– 11 40.4	9.999 266	– 5 39 5	– 0 30 49
Montreal . . .	+45 30 17.0	– 11 40.4	9.999 253	– 0 13 57.15	+ 4 54 18.63
Montsouris . . .	+48 49 18.0	– 11 34.5	9.999 168	– 5 17 36.46	– 0 9 20.68
Moscow . . .	+55 45 19.8	– 10 52.5	9.998 995	– 7 38 32.87	– 2 30 17.09
Mount Hamilton (*Lick*)	+37 20 25.6	– 11 14.9	9.999 461	+ 2 58 19.11	+ 8 6 34.89
Munich . . .	+48 8 45.5	– 11 36.5	9.999 186	– 5 54 41.85	– 0 46 26.07

POSITIONS OF OBSERVATORIES.

(*North Latitudes and West Longitudes are Considered Positive.*)

Place.	Latitude.	Reduction to Geocentric Latitude.	Log ρ.	Longitude. From Washington.	Longitude. From Greenwich.
	° ′ ″	′ ″		h m s	h m s
Naples	+40 51 46.3	− 11 32.8	9.999 372	− 6 5 17.51	− 0 57 1.73
Nashville	+36 8 54.4	− 11 6.6	9.999 490	+ 0 38 56.4	+ 5 47 12.2
Natal	−29 50 46.6	+ 10 3.7	9.999 637	− 7 12 16.96	− 2 4 1.18
Neuchatel	+47 0 1.2	− 11 38.9	9.999 215	− 5 36 5.71	− 0 27 49.93
New Haven (*Old Obs.*)	+41 18 36.5	− 11 34.3	9.999 361	− 0 16 33.64	+ 4 51 42.14
New Haven (*Yale Univ.*)	+41 19 22.3	− 11 34.4	9.999 361	− 0 16 35.20	+ 4 51 40.58
New York (*Columb. Coll.*)	+40 45 23.1	− 11 32.4	9.999 375	− 0 12 22.14	+ 4 55 53.64
New York (RUTHERFURD)	+40 43 48.5	− 11 32.3	9.999 376	− 0 12 19.10	+ 4 55 56.68
Nice	+43 43 16.9	− 11 39.6	9.999 299	− 5 37 27.96	− 0 29 12.18
Nicolaeff	+46 58 21.8	− 11 38.9	9.999 216	− 7 16 9.58	− 2 7 53.80
Northfield	+44 27 41.6	− 11 40.3	9.999 280	+ 1 4 20.03	+ 6 12 35.81
Oakland (*Cal.*)	+37 48 5	− 11 17.9	9.999 449	+ 3 0 50.77	+ 8 9 6.55
Odessa	+46 28 36.7	− 11 39.6	9.999 228	− 7 11 17.88	− 2 3 2.10
Ogden	+41 13 8.6	− 11 34.0	9.999 363	+ 2 19 43.85	+ 7 27 59.63
O-Gyalla	+47 52 27.3	− 11 37.1	9.999 192	− 6 21 1.32	− 1 12 45.54
Olmütz	+49 35 43	− 11 31.8	9.999 149	− 6 17 24	− 1 9 8
Oxford (*Mississippi*)	+34 22 12.6	− 10 52.0	9.999 533	+ 0 49 51.3	+ 5 58 7.1
Oxford (*Radcliffe*)	+51 45 35.4	− 11 21.6	9.999 094	− 5 3 13.2	+ 0 5 2.6
Oxford (*University*)	+51 45 34.2	− 11 21.6	9.999 094	− 5 3 15.4	+ 0 5 0.4
Padua	+45 24 5	− 11 40.4	9.999 256	− 5 55 44.97	− 0 47 29.19
Palermo	+38 6 44.0	− 11 19.7	9.999 442	− 6 1 41.68	− 0 53 25.90
Paramatta	−33 48 49.8	+ 10 46.9	9.999 546	+ 8 47 44.0	−10 4 0.2
Paris	+48 50 11.2	− 11 34.5	9.999 168	− 5 17 36.75	− 0 9 20.97
Philadelphia	+39 57 7.5	− 11 29.2	9.999 396	− 0 7 37.27	+ 5 0 38.51
Philadelphia (*Flower*)	+39 58 2.1	− 11 29.2	9.999 395	− 0 7 9.2	+ 5 1 6.6
Plonsk	+52 37 40.0	− 11 16.4	9.999 072	− 6 29 47.8	− 1 21 32.0
Pola	+44 51 48.7	− 11 40.4	9.999 270	− 6 3 38.67	− 0 55 22.89
Portsmouth	+50 48 3	− 11 26.6	9.999 118	− 5 3 51.0	+ 0 4 24.8
Potsdam	+52 22 56.0	− 11 17.9	9.999 078	− 6 0 31.7	− 0 52 15.9
Poughkeepsie	+41 41 18	− 11 35.5	9.999 351	− 0 12 42.13	+ 4 55 33.65
Prague (*University*)	+50 5 15.8	− 11 29.8	9.999 136	− 6 5 56.1	− 0 57 40.3
Princeton	+40 20 57.8	− 11 30.8	9.999 385	− 0 9 38.17	+ 4 58 37.61
Princeton (*Halsted*)	+40 20 55.8	− 11 30.9	9.999 386	− 0 9 36.34	+ 4 58 39.44
Providence (SEAGRAVE)	+41 49 46.4	− 11 35.9	9.999 348	− 0 22 38.14	+ 4 45 37.64
Providence (*Ladd*)	+41 50 21	− 11 35.9	9.999 348	− 0 22 39.83	+ 4 45 35.95
Pulkowa	+59 46 18.7	− 10 10.4	9.998 902	− 7 9 34.42	− 2 1 18.64
Quebec	+46 47 59.2	− 11 39.2	9.999 220	− 0 23 23.14	+ 4 44 52.64
Quito	− 0 14 0	+ 0 5.7	0.000 000	+ 0 5 50.88	+ 5 14 6.66
Riga	+56 57 9.3	− 10 41.3	9.998 967	− 6 44 43.95	− 1 36 28.17
Rio de Janeiro	−22 54 23.6	+ 8 21.1	9.999 779	− 2 15 34.4	+ 2 52 41.4
Rochester	+43 9 16.8	− 11 38.8	9.999 314	+ 0 2 6.00	+ 5 10 21.78
Rome (*Coll. Rom.*)	+41 53 53.6	− 11 36.1	9.999 346	− 5 58 11.33	− 0 49 55.55
Rome (*Capitol*)	+41 53 33.5	− 11 36.0	9.999 346	− 5 58 12.15	− 0 49 56.37
Rome (*Vatican*)	+41 54 4.8	− 11 36.1	9.999 346	− 5 58 5.25	− 0 49 49.47
Rousdon	+50 42 38	− 11 27.0	9.999 120	− 4 56 16.84	+ 0 11 58.94
Rugby	+52 22 7	− 11 18.0	9.999 079	− 5 3 13.8	+ 0 5 2.0

POSITIONS OF OBSERVATORIES.

(*North Latitudes and West Longitudes are Considered Positive.*)

Place.	Latitude.	Reduction to Geocentric Latitude.	Log ρ.	Longitude.	
				From Washington.	From Greenwich.
	° ′ ″	′ ″		h m s	h m s
San Fernando	+36 27 42.0	−11 8.9	9.999 483	−4 43 26.6	+0 24 49.2
San Francisco	+37 47 27.9	−11 17.8	9.999 450	+3 1 27.08	+8 9 42.86
Santiago de Chile	−33 26 42.0	+10 43.4	9.999 555	−0 25 29.56	+4 42 46.22
South Hadley	+42 15 18.2	−11 37.0	9.999 337	−0 17 55.49	+4 50 20.29
Speier	+49 18 55.2	−11 32.9	9.999 156	−5 42 1.34	−0 33 45.56
St. Louis	+38 38 3.0	−11 22.7	9.999 429	+0 52 33.48	+6 0 49.26
St. Petersburg (*Academy*)	+59 56 29.7	−10 8.4	9.998 898	−7 9 29.24	−2 1 13.46
St. Petersburg (*Univ.*)	+59 56 32.0	−10 8.4	9.998 898	−7 9 27.2	−2 1 11.4
Stockholm	+59 20 33.0	−10 15.5	9.998 912	−6 20 29.77	−1 12 13.99
Stonyhurst	+53 50 40	−11 8.0	9.999 042	−4 58 23.10	+0 9 52.68
Strassburg (*New Obs.*)	+48 35 0.3	−11 35.3	9.999 174	−5 39 20.47	−0 31 4.69
Strassburg (*Old Obs.*)	+48 34 53.8	−11 35.3	9.999 174	−5 39 18.27	−0 31 2.49
Sydney	−33 51 41.1	+10 47.3	9.999 545	+8 46 54.68	−10 4 49.54
Syracuse	+43 2 13.1	−11 38.6	9.999 317	−0 3 42.42	+5 4 33.36
Tacubaya	+19 24 17.5	−7 17.8	9.999 839	+1 28 30.75	+6 36 46.53
Taschkent	+41 19 31.3	−11 34.4	9.999 361	−9 45 26.58	−4 37 10.80
Tokio	+35 39 17.5	−11 2.8	9.999 502	+9 32 46.20	−9 18 58.02
Toronto	+43 39 35.9	−11 39.6	9.999 301	+0 9 18.87	+5 17 34.65
Toulouse	+43 36 45	−11 39.5	9.999 302	−5 14 5.66	−0 5 49.88
Trieste	+45 38 45.4	−11 40.3	9.999 250	−6 3 18.73	−0 55 2.95
Troy (*N. Y.*)	+42 43 52.9	−11 38.1	9.999 325	−0 13 33.49	+4 54 42.29
Tulse Hill	+51 26 47.0	−11 23.3	9.999 102	−5 7 48.1	+0 0 27.7
Turin	+45 4 8.0	−11 40.4	9.999 265	−5 39 2.96	−0 30 47.18
Tuscaloosa (*Ala. Univ.*)	+33 12 36.8	−10 41.1	9.999 561	+0 41 55.96	+5 50 11.74
Twickenham	+51 27 4.2	−11 23.3	9.999 102	−5 7 2.7	+0 1 13.1
Upsala (*New Obs.*)	+59 51 29.4	−10 9.3	9.998 900	−6 18 45.93	−1 10 30.15
Utrecht	+52 5 9.6	−11 19.7	9.999 086	−5 28 46.8	−0 20 31.0
Venice	+45 26 10.5	−11 40.4	9.999 255	−5 57 37.90	−0 49 22.12
Vienna (*Josephstadt*)	+48 12 53.8	−11 36.2	9.999 183	−6 13 41.1	−1 5 25.3
Vienna (*New Obs.*)	+48 13 55.4	−11 36.2	9.999 183	−6 13 37.17	−1 5 21.39
Vienna (*Old Obs.*)	+48 12 35.5	−11 36.3	9.999 184	−6 13 47.42	−1 5 31.64
Vienna (*Ottakring*)	+48 12 46.7	−11 36.2	9.999 183	−6 13 26.89	−1 5 11.11
Warsaw	+52 13 4.7	−11 18.9	9.999 082	−6 32 23.06	−1 24 7.28
Washington	+38 55 14.0	−11 24.2	9.999 422	0 0 0.00	+5 8 15.78
Washington (*Old Obs.*)	+38 53 38.8	−11 24.1	9.999 422	−0 0 3.63	+5 8 12.15
Washington (*Smithsonian*)	+38 53 17.3	−11 24.1	9.999 422	−0 0 9.6	+5 8 6.2
Washington (*Cath. Univ.*)	+38 56 14.8	−11 24.2	9.999 422	−0 0 15.78	+5 8 0.00
Wellington	−41 18 0.6	+11 34.3	9.999 361	+7 12 37.70	−11 39 6.52
West Point (*Old Obs.*)	+41 23 31	−11 34.6	9.999 359	−0 12 26.34	+4 55 49.44
West Point (*New Obs.*)	+41 23 22.1	−11 34.6	9.999 359	−0 12 25.23	+4 55 50.55
Wilhelmshaven	+53 31 52.2	−11 10.3	9.999 050	−5 40 50.89	−0 32 35.11
Williamstown (*Mass.*)	+42 42 30	−11 38.0	9.999 325	−0 15 26	+4 52 50
Williamstown (*Victoria*)	−37 52 7.2	+11 18.3	9.999 448	+9 12 6.1	−9 39 38.1
Wilna	+54 40 59.1	−11 1.6	9.999 021	−6 49 24.60	−1 41 8.82
Windsor	−33 36 30.8	+10 44.9	9.999 551	+8 48 23.7	−10 3 20.5
Williams Bay (*Yerkes*)	+42 34 12.6	−11 37.7	9.999 329	+0 45 57.46	+5 54 13.24
Zürich	+47 22 40.0	−11 38.2	9.999 205	−5 42 28.08	−0 34 12.30

PART IV.

APPARENT PLACES OF STARS, STAR-NUMBERS AND OTHER DATA,

BASED ON THE CONSTANTS OF THE PARIS CONFERENCE OF 1896.

FORMULÆ FOR THE REDUCTION OF THE POSITIONS OF THE FIXED STARS, USING THE NOTATION OF BESSEL, AND THE CONSTANTS OF THE PARIS CONFERENCE OF MAY, 1896.

NOTATION.

τ, the time reckoned in units of one year, from the beginning of the Besselian fictitious year (1909, January $0^{d}.279$, Washington mean time),

α_0, δ_0, the star's mean right ascension and declination at the beginning of the fictitious year,

α, δ, the star's apparent right ascension and declination at the time τ,

μ, μ', the annual proper motion in right ascension and declination,

$\odot$, the Sun's true longitude,

L, the Sun's mean longitude,

☊, the longitude of the Moon's ascending node,

ω, the obliquity of the ecliptic,

Γ', the longitude of the Moon's perigee,

☾, the Moon's mean longitude.

BESSELIAN STAR-NUMBERS.

$$\begin{aligned}
A = \tau &- 0.342\,18 \sin \text{☊} & &+0.000\,24 \sin (\text{☾}+\Gamma') \\
&+ 0.004\,15 \sin 2\,\text{☊} & &+0.001\,33 \sin (\text{☾}-\Gamma') \\
&- 0.024\,95 \sin 2\,\mathrm{L} & &-0.000\,68 \sin (2\,\text{☾}-\text{☊}) \\
&+ 0.002\,18 \sin (\mathrm{L}+75^{\circ}.3) & &-0.000\,52 \sin (3\,\text{☾}-\Gamma') \\
&- 0.000\,97 \sin (3\,\mathrm{L}+78^{\circ}.7) & &+0.000\,30 \sin (\text{☾}-2\,\mathrm{L}+\Gamma') \\
&+ 0.000\,24 \sin (2\,\mathrm{L}-\text{☊}) & &+0.000\,12 \sin 2\,(\text{☾}-\mathrm{L}) \\
&- 0.004\,05 \sin 2\,\text{☾} & &
\end{aligned}$$

$$\begin{aligned}
& \quad '' & & \quad '' \\
B = &- 9.210 \cos \text{☊} & &+0.007 \cos (2\,\mathrm{L}-\text{☊}) \\
&+ 0.090 \cos 2\,\text{☊} & &-0.088 \cos 2\,\text{☾} \\
&- 0.546 \cos 2\,\mathrm{L} & &-0.018 \cos (2\,\text{☾}-\text{☊}) \\
&- 0.021 \cos (3\,\mathrm{L}+78^{\circ}.7) & &-0.011 \cos (3\,\text{☾}-\Gamma') \\
&+ 0.009 \cos (\mathrm{L}-78^{\circ}.7) & &+0.005 \cos (\text{☾}+\Gamma')
\end{aligned}$$

$$C = -20.4700 \cos \omega \cos \odot$$

$$D = -20.4700 \sin \odot$$

$$E = -\ 0.0421 \sin \text{☊} + 0''.0005 \sin 2\,\text{☊} - 0''.0031 \sin 2\,\mathrm{L}$$

BESSEL'S *Star-Constants.*

$$a = 3^{s}.072\,50 + 1^{s}.336\,40 \sin \alpha_0 \tan \delta_0 = \text{precession in right ascension}$$

$$b = \tfrac{1}{15} \cos \alpha_0 \tan \delta_0$$

$$c = \tfrac{1}{15} \cos \alpha_0 \sec \delta_0$$

$$d = \tfrac{1}{15} \sin \alpha_0 \sec \delta_0$$

$$a' = 20''.0460 \cos \alpha_0 = \text{precession in declination}$$

$$b' = -\sin \alpha_0$$

$$c' = \tan \omega \cos \delta_0 - \sin \alpha_0 \sin \delta_0$$

$$d' = \cos \alpha_0 \sin \delta_0$$

Reduction to Apparent Position.

$$\alpha = \alpha_0 + \tau\mu + Aa + Bb + Cc + Dd + \tfrac{1}{15}E \qquad \text{(in time)}$$

$$\delta = \delta_0 + \tau\mu' + Aa' + Bb' + Cc' + Dd' \qquad \text{(in arc)}$$

INDEPENDENT STAR-NUMBERS.

$$f = f' + f'' = +\,46''.0875\,A + E \text{ (in arc)} = 3^{s}.072\,50\,A + \tfrac{1}{15}E \qquad \text{(in time)}$$

$$\begin{aligned}
f'' = &- 0^{s}.0124 \sin 2\,\text{☾} + 0^{s}.0041 \sin (\text{☾}-\Gamma') + 0^{s}.0007 \sin (\text{☾}+\Gamma') \\
&- 0^{s}.0021 \sin (2\,\text{☾}-\text{☊}) - 0^{s}.0016 \sin (3\,\text{☾}-\Gamma') \\
&+ 0^{s}.0009 \sin (\text{☾}-2\,\mathrm{L}+\Gamma') + 0^{s}.0004 \sin 2\,(\text{☾}-\mathrm{L})
\end{aligned}$$

$$g \sin G = B \qquad h \sin H = C$$

$$g \cos G = 20''.0460\,A \qquad h \cos H = D \qquad i = C \tan \omega$$

Reduction to Apparent Position.

$$\alpha = \alpha_0 + f + \tau\mu + \tfrac{1}{15}\,g \sin (G+\alpha_0) \tan \delta_0 + \tfrac{1}{15}\,h \sin (H+\alpha_0) \sec \delta_0 \quad \text{(in time)}$$

$$\delta = \delta_0 + \tau\mu' + g \cos (G+\alpha_0) + h \cos (H+\alpha_0) \sin \delta_0 + i \cos \delta_0 \qquad \text{(in arc)}$$

NOTES.—(1) The independent star-numbers are more convenient, when only one or two apparent positions of a star are required, or when BESSEL'S star-constants are not known with sufficient accuracy. Otherwise, the Besselian star-numbers are more convenient.

(2) In using the star-constants of the *British Association Catalogue*, a, b, c, d, a', b', c', d', with the star-numbers of this Ephemeris, the quantities to be formed are Ac, Bd, Ca, Db, $-Ac'$, $-Bd'$, $-Ca'$, $-Db'$.

PRECESSION, OBLIQUITY, ETC., 1909.

(CONSTANTS OF PARIS CONFERENCE.)

FOR GREENWICH MEAN NOON.

Date.	Precession in Longitude from 1909.0	Nutation.			Obliquity of Ecliptic. (*Newcomb.*)	The Sun's Aberration.
		In Longitude.	In R. A.	In Obliquity.		
		"	s	"	° ' "	"
Jan. 0	− 0.07	− 16.72	− 1.023	+ 0.35	23 27 4.39	− 20.81
10	+ 1.31	16.29	0.997	0.53	4.56	20.81
20	2.68	15.95	0.976	0.76	4.77	20.80
30	4.06	15.76	0.964	1.03	5.03	20.77
Feb. 9	5.44	15.72	0.962	1.30	5.29	20.74
19	+ 6.81	− 15.83	− 0.969	+ 1.57	23 27 5.54	− 20.70
Mar. 1	8.19	16.09	0.985	1.81	5.77	20.65
11	9.56	16.43	1.005	1.98	5.93	20.59
21	10.94	16.82	1.030	2.10	6.04	20.54
31	12.31	17.22	1.054	2.14	6.07	20.48
Apr. 10	+ 13.69	− 17.56	− 1.075	+ 2.13	23 27 6.04	− 20.42
20	15.07	17.81	1.090	2.07	5.97	20.36
30	16.44	17.94	1.098	1.99	5.87	20.31
May 10	17.82	17.92	1.097	1.88	5.76	20.26
20	19.19	17.76	1.087	1.79	5.65	20.22
30	+ 20.57	− 17.49	− 1.070	+ 1.73	23 27 5.58	− 20.18
June 9	21.94	17.13	1.048	1.72	5.55	20.15
19	23.32	16.71	1.023	1.76	5.58	20.14
29	24.70	16.28	0.996	1.85	5.66	20.13
July 9	26.07	15.88	0.972	2.01	5.80	20.13
19	+ 27.45	− 15.56	− 0.952	+ 2.21	23 27 5.99	− 20.14
29	28.82	15.33	0.938	2.44	6.21	20.16
Aug. 8	30.20	15.25	0.933	2.70	6.46	20.18
18	31.58	15.29	0.936	2.96	6.70	20.22
28	32.95	15.46	0.946	3.20	6.93	20.26
Sept. 7	+ 34.33	− 15.73	− 0.963	+ 3.40	23 27 7.12	− 20.31
17	35.70	16.08	0.983	3.54	7.25	20.37
27	37.08	16.45	1.007	3.63	7.32	20.42
Oct 7	38.45	16.81	1.029	3.65	7.33	20.48
17	39.83	17.09	1.046	3.62	7.29	20.54
27	+ 41.21	− 17.27	− 1.056	+ 3.54	23 27 7.20	− 20.60
Nov. 6	42.58	17.30	1.059	3.43	7.08	20.65
16	43.96	17.16	1.050	3.32	6.95	20.70
26	45.33	16.87	1.032	3.23	6.85	20.74
Dec. 6	46.71	16.47	1.008	3.16	6.77	20.77
16	+ 48.08	− 15.96	− 0.977	+ 3.17	23 27 6.76	− 20.80
26	49.46	15.43	0.944	3.25	6.83	20.81
36	+ 50.84	− 14.91	− 0.913	+ 3.38	23 27 6.96	− 20.81

Mean Obliquity, 1909.0 23° 27′ 4″.04 (*Newcomb*).

	"	
Precession for 1909	50.2584	log = 1.70121
Precession in a Solar Day	0.1376	log = 9.13863
Precession in a Sidereal Day	0.1372	log = 9.13744

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)	Log *A.*	Log *B.*	Log *C.*	Log *D.*	Solar Day. (Sid. Hour.)	Log *A.*	Log *B.*	Log *C.*	Log *D.*
Jan. 0	−9.52278	−9.6107	−0.52107	+1.30422	Feb. 15	−9.27568	−0.1439	−1.19685	+1.04821
1	9.51859	9.5810	0.56202	1.30277	16	9.26463	0.1536	1.20174	1.03624
2	9.51314	9.5501	0.59931	1.30117	17	9.25404	0.1694	1.20644	1.02379
3	9.50664	9.5298	0.63353	1.29942	18	9.24509	0.1891	1.21096	1.01084
4	9.49947	9.5298	0.66511	1.29753	19	9.23855	0.2093	1.21529	0.99736
($7^{h}.0$) 5	−9.49215	−9.5527	−0.69442	+1.29549	($10^{h}.0$) 20	−9.23462	−0.2269	−1.21944	+0.98332
6	9.48514	9.5931	0.72175	1.29331	21	9.23267	0.2394	1.22342	0.96867
7	9.47881	9.6427	0.74733	1.29098	22	9.23155	0.2457	1.22724	0.95339
8	9.47341	9.6934	0.77136	1.28850	23	9.22984	0.2464	1.23088	0.93741
9	9.46900	9.7399	0.79399	1.28586	24	9.22655	0.2426	1.23435	0.92069
10	−9.46550	−9.7792	−0.81537	+1.28307	25	−9.22094	−0.2370	−1.23767	+0.90318
11	9.46273	9.8095	0.83562	1.28013	26	9.21304	0.2321	1.24082	0.88480
12	9.46041	9.8298	0.85483	1.27702	27	9.20330	0.2302	1.24382	0.86548
13	9.45815	9.8397	0.87310	1.27376	28	9.19260	0.2326	1.24667	0.84513
14	9.45547	9.8401	0.89049	1.27033	Mar. 1	9.18207	0.2393	1.24936	0.82365
15	−9.45183	−9.8324	−0.90709	+1.26674	2	−9.17254	−0.2496	−1.25190	+0.80094
16	9.44679	9.8205	0.92294	1.26298	3	9.16474	0.2620	1.25429	0.77683
17	9.44019	9.8100	0.93809	1.25904	4	9.15897	0.2748	1.25654	0.75119
18	9.43217	9.8072	0.95260	1.25494	5	9.15531	0.2868	1.25864	0.72381
19	9.42318	9.8176	0.96651	1.25066	6	9.15336	0.2968	1.26060	0.69446
($8^{h}.0$) 20	−9.41397	−9.8423	−0.97985	+1.24619	($11^{h}.0$) 7	−9.15266	−0.3040	−1.26242	+0.66286
21	9.40541	9.8780	0.99266	1.24154	8	9.15247	0.3080	1.26410	0.62865
22	9.39824	9.9178	1.00497	1.23671	9	9.15210	0.3085	1.26564	0.59140
23	9.39287	9.9551	1.01680	1.23168	10	9.15048	0.3057	1.26704	0.55051
24	9.38929	9.9848	1.02818	1.22646	11	9.14684	0.3004	1.26830	0.50526
25	−9.38694	−0.0044	−1.03913	+1.22104	12	−9.14038	−0.2942	−1.26943	+0.45461
26	9.38486	0.0133	1.04968	1.21541	13	9.13082	0.2888	1.27043	0.39715
27	9.38209	0.0134	1.05984	1.20957	14	9.11869	0.2865	1.27129	0.33079
28	9.37792	0.0076	1.06963	1.20351	15	9.10479	0.2887	1.27201	0.25231
29	9.37206	0.0006	1.07907	1.19724	16	9.09086	0.2957	1.27261	0.15633
30	−9.36466	−9.9962	−1.08817	+1.19073	17	−9.07864	−0.3065	−1.27308	+0.03284
31	9.35621	9.9982	1.09695	1.18399	18	9.06948	0.3188	1.27341	9.85955
Feb. 1	9.34733	0.0077	1.10541	1.17701	19	9.06405	0.3301	1.27361	9.56674
2	9.33872	0.0242	1.11358	1.16977	20	9.06172	0.3383	1.27368	+8.14375
3	9.33099	0.0456	1.12147	1.16228	21	9.06100	0.3418	1.27362	−9.53240
($9^{h}.0$) 4	−9.32453	−0.0690	−1.12907	+1.15453	($12^{h}.0$) 22	−9.05998	−0.3405	−1.27342	−9.84202
5	9.31949	0.0920	1.13641	1.14649	23	9.05698	0.3352	1.27310	0.02077
6	9.31581	0.1128	1.14349	1.13817	24	9.05050	0.3274	1.27266	0.14686
7	9.31330	0.1301	1.15032	1.12955	25	9.04025	0.3194	1.27207	0.24430
8	9.31161	0.1428	1.15691	1.12062	26	9.02682	0.3132	1.27136	0.32368
9	−9.31020	−0.1506	−1.16327	+1.11137	27	−9.01132	−0.3103	−1.27052	−0.39062
10	9.30842	0.1535	1.16940	1.10178	28	8.99515	0.3112	1.26955	0.44846
11	9.30561	0.1520	1.17531	1.09184	29	8.98005	0.3156	1.26845	0.49934
12	9.30116	0.1476	1.18100	1.08153	30	8.96717	0.3222	1.26721	0.54474
13	9.29464	0.1430	1.18649	1.07084	31	8.95751	0.3299	1.26585	0.58570
14	−9.28599	−0.1408	−1.19177	+1.05974	Apr. 1	−8.95090	−0.3373	−1.26435	−0.62298
15	−9.27568	−0.1439	−1.19685	+1.04821	2	−8.94709	−0.3433	−1.26272	−0.65716

E = − 0″.04 = − $0^{s}.003$

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)	Log *A*.	Log *B*.	Log *C*.	Log *D*.	Solar Day. (Sid. Hour.)	Log *A*.	Log *B*.	Log *C*.	Log *D*.
Apr. 1	−8.95090	−0.3373	−1.26435	−0.62298	May 17	+8.26905	−0.2665	−1.01427	−1.23279
2	8.94709	0.3433	1.26272	0.65716	18	8.33766	0.2535	1.00299	1.23751
3	8.94547	0.3472	1.26095	0.68874	19	8.41364	0.2411	0.99129	1.24206
4	8.94488	0.3483	1.25905	0.71802	20	8.48855	0.2317	0.97914	1.24644
5	8.94414	0.3463	1.25702	0.74532	21	8.55666	0.2269	0.96652	1.25065
$(13^{h}.0)$ 6	−8.94181	−0.3412	−1.25484	−0.77087	$(16^{h}.0)$ 22	+8.61395	−0.2271	−0.95340	−1.25470
7	8.93636	0.3335	1.25253	0.79487	23	8.66001	0.2315	0.93976	1.25859
8	8.92660	0.3244	1.25008	0.81747	24	8.69566	0.2386	0.92556	1.26232
9	8.91169	0.3154	1.24749	0.83883	25	8.72230	0.2464	0.91075	1.26590
10	8.89170	0.3086	1.24475	0.85905	26	8.74178	0.2535	0.89530	1.26932
11	−8.86753	−0.3057	−1.24188	−0.87824	27	+8.75633	−0.2587	−0.87916	−1.27260
12	8.84142	0.3075	1.23885	0.89649	28	8.76782	0.2611	0.86228	1.27573
13	8.81677	0.3135	1.23568	0.91387	29	8.77830	0.2601	0.84459	1.27872
14	8.79637	0.3221	1.23236	0.93045	30	8.78951	0.2556	0.82603	1.28156
15	8.78204	0.3306	1.22889	0.94630	31	8.80366	0.2477	0.80653	1.28426
16	−8.77393	−0.3370	−1.22526	−0.96146	June 1	+8.82210	−0.2374	−0.78599	−1.28683
17	8.76987	0.3393	1.22148	0.97597	2	8.84541	0.2261	0.76430	1.28926
18	8.76619	0.3367	1.21754	0.98989	3	8.87274	0.2162	0.74136	1.29155
19	8.75861	0.3295	1.21344	1.00324	4	8.90238	0.2100	0.71702	1.29371
20	8.74453	0.3192	1.20918	1.01607	5	8.93202	0.2093	0.69111	1.29574
$(14^{h}.0)$ 21	−8.72198	−0.3078	−1.20474	−1.02840	$(17^{h}.0)$ 6	+8.95904	−0.2147	−0.66343	−1.29764
22	8.69046	0.2976	1.20014	1.04026	7	8.98173	0.2250	0.63374	1.29941
23	8.65089	0.2904	1.19536	1.05168	8	8.99904	0.2376	0.60175	1.30105
24	8.60584	0.2873	1.19041	1.06268	9	9.01144	0.2494	0.56708	1.30257
25	8.55883	0.2882	1.18527	1.07327	10	9.01982	0.2578	0.52931	1.30396
26	−8.51322	−0.2922	−1.17995	−1.08349	11	+9.02612	−0.2609	−0.48775	−1.30522
27	8.47276	0.2979	1.17444	1.09334	12	9.03274	0.2583	0.44170	1.30636
28	8.43996	0.3038	1.16874	1.10284	13	9.04179	0.2509	0.39004	1.30738
29	8.41531	0.3087	1.16284	1.11202	14	9.05434	0.2406	0.33127	1.30827
30	8.39707	0.3116	1.15673	1.12088	15	9.07022	0.2303	0.26314	1.30904
May 1	−8.38364	−0.3118	−1.15042	−1.12943	16	+9.08860	−0.2226	−0.18218	−1.30969
2	8.36940	0.3088	1.14388	1.13769	17	9.10779	0.2195	0.08244	1.31022
3	8.35064	0.3024	1.13713	1.14567	18	9.12623	0.2217	9.95261	1.31062
4	8.31890	0.2931	1.13015	1.15338	19	9.14276	0.2286	9.76641	1.31091
5	8.26694	0.2817	1.12293	1.16084	20	9.15658	0.2386	−9.43341	1.31107
$(15^{h}.0)$ 6	−8.18270	−0.2699	−1.11546	−1.16804	$(18^{h}.0)$ 21	+9.16764	−0.2499	+8.61784	−1.31112
7	8.04376	0.2599	1.10775	1.17500	22	9.17629	0.2608	9.54919	1.31104
8	7.79727	0.2536	1.09977	1.18172	23	9.18287	0.2700	9.82392	1.31084
9	−7.10037	0.2527	1.09151	1.18822	24	9.18808	0.2766	9.99077	1.31053
10	+7.53908	0.2570	1.08298	1.19450	25	9.19268	0.2800	0.11091	1.31009
11	+7.87332	−0.2650	−1.07415	−1.20056	26	+9.19745	−0.2801	+0.20481	−1.30953
12	8.02036	0.2743	1.06502	1.20642	27	9.20306	0.2771	0.28186	1.30885
13	8.09726	0.2820	1.05557	1.21208	28	9.21018	0.2715	0.34716	1.30805
14	8.14145	0.2857	1.04578	1.21754	29	9.21943	0.2648	0.40381	1.30713
15	8.17493	0.2842	1.03565	1.22280	30	9.23081	0.2588	0.45380	1.30608
16	+8.21431	−0.2775	−1.02515	−1.22789	July 1	+9.24386	−0.2556	+0.49852	−1.30492
17	+8.26905	−0.2665	−1.01427	−1.23279	2	+9.25768	−0.2571	+0.53894	−1.30362

$E = -0''.04 = -0^{s}.003$

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)	Log *A.*	Log *B.*	Log *C.*	Log *D.*	Solar Day. (Sid. Hour.)	Log *A.*	Log *B.*	Log *C.*	Log *D.*
July 1	+9.24386	−0.2556	+0.49852	−1.30492	Aug. 16	+9.51208	−0.4748	+1.17964	−1.08406
2	9.25768	0.2571	0.53894	1.30362	17	9.51346	0.4822	1.18492	1.07398
3	9.27110	0.2639	0.57582	1.30221	18	9.51431	0.4875	1.19001	1.06352
4	9.28308	0.2754	0.60969	1.30067	19	9.51501	0.4907	1.19493	1.05268
5	9.29277	0.2896	0.64100	1.29900	20	9.51590	0.4917	1.19967	1.04143
h 6	+9.29988	−0.3040	+0.67009	−1.29720	h (22.0) 21	+9.51733	−0.4909	+1.20423	−1.02975
(19.0) 7	9.30477	0.3158	0.69725	1.29528	22	9.51962	0.4888	1.20864	1.01762
8	9.30816	0.3233	0.72270	1.29323	23	9.52295	0.4863	1.21287	1.00501
9	9.31122	0.3259	0.74663	1.29105	24	9.52738	0.4847	1.21695	0.99189
10	9.31513	0.3239	0.76920	1.28873	25	9.53261	0.4850	1.22087	0.97823
11	+9.32069	−0.3189	+0.79054	−1.28628	26	+9.53825	−0.4881	+1.22463	−0.96399
12	9.32822	0.3151	0.81077	1.28370	27	9.54368	0.4942	1.22824	0.94914
13	9.33748	0.3089	0.82999	1.28098	28	9.54830	0.5026	1.23169	0.93362
14	9.34772	0.3081	0.84828	1.27812	29	9.55175	0.5121	1.23500	0.91740
15	9.35801	0.3116	0.86572	1.27511	30	9.55390	0.5211	1.23816	0.90041
16	+9.36758	−0.3191	+0.88237	−1.27197	31	+9.55494	−0.5280	+1.24118	−0.88259
17	9.37576	0.3297	0.89829	1.26868	Sept. 1	9.55540	0.5320	1.24406	0.86387
18	9.38241	0.3415	0.91353	1.26525	2	9.55586	0.5328	1.24679	0.84417
19	9.38751	0.3533	0.92815	1.26166	3	9.55699	0.5309	1.24939	0.82338
20	9.39127	0.3638	0.94217	1.25793	4	9.55918	0.5273	1.25185	0.80141
h 21	+9.39407	−0.3722	+0.95563	−1.25404	h (23.0) 5	+9.56254	−0.5236	+1.25417	−0.77813
(20.0) 22	9.39634	0.3781	0.96858	1.24999	6	9.56680	0.5212	1.25636	0.75337
23	9.39853	0.3812	0.98104	1.24578	7	9.57156	0.5211	1.25841	0.72697
24	9.40107	0.3818	0.99303	1.24140	8	9.57624	0.5237	1.26033	0.69871
25	9.40451	0.3801	1.00458	1.23687	9	9.58037	0.5285	1.26212	0.66833
26	+9.40919	−0.3772	+1.01572	−1.23216	10	+9.58366	−0.5349	+1.26378	−0.63552
27	9.41522	0.3744	1.02646	1.22727	11	9.58598	0.5417	1.26531	0.59985
28	9.42254	0.3732	1.03683	1.22221	12	9.58742	0.5481	1.26671	0.56084
29	9.43069	0.3750	1.04684	1.21696	13	9.58813	0.5534	1.26798	0.51781
30	9.43903	0.3807	1.05651	1.21153	14	9.58834	0.5570	1.26912	0.46988
31	+9.44675	−0.3902	+1.06585	−1.20590	15	+9.58840	−0.5588	+1.27013	−0.41581
Aug. 1	9.45313	0.4023	1.07488	1.20008	16	9.58854	0.5587	1.27102	0.35387
2	9.45794	0.4150	1.08361	1.19405	17	9.58907	0.5569	1.27177	0.28141
3	9.46106	0.4264	1.09205	1.18781	18	9.59027	0.5538	1.27240	0.19419
4	9.46291	0.4348	1.10021	1.18136	19	9.59235	0.5500	1.27291	0.08470
h 5	+9.46424	−0.4394	+1.10810	−1.17468	h 20	+9.59536	−0.5466	+1.27329	−9.93770
(21.0) 6	9.46587	0.4401	1.11574	1.16778	(0.0) 21	9.59915	0.5445	1.27354	9.71346
7	9.46850	0.4380	1.12313	1.16063	22	9.60346	0.5446	1.27366	−9.22328
8	9.47246	0.4345	1.13028	1.15324	23	9.60778	0.5473	1.27366	+9.26179
9	9.47777	0.4316	1.13720	1.14560	24	9.61162	0.5523	1.27353	9.72655
10	+9.48406	−0.4308	+1.14388	−1.13769	25	+9.61459	−0.5587	+1.27327	+9.94589
11	9.49062	0.4333	1.15036	1.12950	26	9.61651	0.5652	1.27289	0.09091
12	9.49693	0.4388	1.15662	1.12103	27	9.61744	0.5704	1.27237	0.19939
13	9.50237	0.4469	1.16267	1.11227	28	9.61772	0.5731	1.27173	0.28605
14	9.50672	0.4563	1.16852	1.10320	29	9.61791	0.5729	1.27096	0.35820
15	+9.50993	−0.4660	+1.17418	−1.09380	30	+9.61854	−0.5699	+1.27006	+0.41997
16	+9.51208	−0.4748	+1.17964	−1.08406	Oct. 1	+9.62006	−0.5651	+1.26903	+0.47395

$E = -0''.04 = -0^s.003$

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)		Log *A*.	Log *B*.	Log *C*.	Log *D*.	Solar Day. (Sid. Hour.)		Log *A*.	Log *B*.	Log *C*.	Log *D*.
Oct.	1	+9.62006	−0.5651	+1.26903	+0.47395	Nov.	16	+9.72950	−0.5066	+1.04046	+1.22035
	2	9.62265	0.5595	1.26787	0.52188		17	9.73353	0.5081	1.02964	1.22576
	3	9.62619	0.5547	1.26657	0.56495		18	9.73711	0.5120	1.01840	1.23097
	4	9.63025	0.5518	1.26514	0.60404		19	9.73996	0.5172	1.00673	1.23599
	5	9.63448	0.5513	1.26358	0.63980		20	9.74198	0.5221	0.99458	1.24081
h (1.0)	6	+9.63836	−0.5532	+1.26188	+0.67275	h (4.0)	21	+9.74336	−0.5252	+0.98195	+1.24546
	7	9.64156	0.5569	1.26004	0.70326		22	9.74441	0.5255	0.96879	1.24992
	8	9.64392	0.5614	1.25807	0.73167		23	9.74557	0.5226	0.95508	1.25420
	9	9.64543	0.5658	1.25595	0.75823		24	9.74723	0.5169	0.94077	1.25831
	10	9.64632	0.5693	1.25369	0.78316		25	9.74968	0.5095	0.92584	1.26225
	11	+9.64670	−0.5713	+1.25129	+0.80660		26	+9.75297	−0.5020	+0.91022	+1.26602
	12	9.64690	0.5716	1.24875	0.82877		27	9.75695	0.4959	0.89388	1.26962
	13	9.64715	0.5701	1.24606	0.84973		28	9.76127	0.4924	0.87675	1.27306
	14	9.64774	0.5669	1.24321	0.86961		29	9.76559	0.4921	0.85877	1.27634
	15	9.64884	0.5622	1.24021	0.88851		30	9.76953	0.4945	0.83986	1.27947
	16	+9.65067	−0.5567	+1.23706	+0.90650	Dec.	1	+9.77287	−0.4988	+0.81995	+1.28243
	17	9.65332	0.5512	1.23376	0.92366		2	9.77554	0.5037	0.79892	1.28524
	18	9.65672	0.5466	1.23030	0.94006		3	9.77759	0.5083	0.77667	1.28790
	19	9.66067	0.5440	1.22667	0.95573		4	9.77916	0.5117	0.75307	1.29041
	20	9.66475	0.5439	1.22288	0.97074		5	9.78045	0.5133	0.72796	1.29277
h (2.0)	21	+9.66860	−0.5464	+1.21893	+0.98513	h (5.0)	6	+9.78165	−0.5130	+0.70115	+1.29498
	22	9.67176	0.5507	1.21480	0.99893		7	9.78297	0.5107	0.67243	1.29705
	23	9.67406	0.5557	1.21050	1.01220		8	9.78459	0.5068	0.64150	1.29897
	24	9.67546	0.5598	1.20602	1.02495		9	9.78667	0.5016	0.60805	1.30075
	25	9.67623	0.5619	1.20136	1.03721		10	9.78928	0.4961	0.57165	1.30238
	26	+9.67678	−0.5611	+1.19651	+1.04901		11	+9.79250	−0.4911	+0.53176	+1.30387
	27	9.67759	0.5573	1.19147	1.06038		12	9.79616	0.4878	0.48767	1.30522
	28	9.67913	0.5512	1.18624	1.07134		13	9.80010	0.4872	0.43842	1.30643
	29	9.68163	0.5439	1.18081	1.08190		14	9.80402	0.4896	0.38270	1.30750
	30	9.68503	0.5370	1.17517	1.09208		15	9.80760	0.4948	0.31859	1.30843
	31	+9.68910	−0.5316	+1.16932	+1.10191		16	+9.81060	−0.5018	+0.24318	+1.30922
Nov.	1	9.69346	0.5288	1.16325	1.11140		17	9.81291	0.5091	0.15169	1.30988
	2	9.69764	0.5287	1.15696	1.12056		18	9.81456	0.5150	0.03545	1.31039
	3	9.70127	0.5308	1.15043	1.12941		19	9.81578	0.5184	9.87603	1.31077
	4	9.70422	0.5342	1.14367	1.13795		20	9.81691	0.5185	9.62122	1.31101
h (3.0)	5	+9.70640	−0.5379	+1.13666	+1.14621	h (6.0)	21	+9.81836	−0.5157	+8.92567	+1.31111
	6	9.70794	0.5408	1.12940	1.15418		22	9.82038	0.5108	−9.39713	1.31108
	7	9.70902	0.5425	1.12187	1.16188		23	9.82313	0.5052	9.76587	1.31091
	8	9.70984	0.5424	1.11407	1.16933		24	9.82651	0.5007	9.96230	1.31060
	9	9.71065	0.5405	1.10599	1.17652		25	9.83031	0.4987	0.09696	1.31015
	10	+9.71167	−0.5367	+1.09761	+1.18346		26	+9.83421	−0.4997	−0.19951	+1.30957
	11	9.71315	0.5313	1.08893	1.19016		27	9.83787	0.5036	0.28229	1.30885
	12	9.71520	0.5248	1.07993	1.19664		28	9.84107	0.5098	0.35168	1.30799
	13	9.71796	0.5181	1.07060	1.20289		29	9.84367	0.5169	0.41139	1.30698
	14	9.72138	0.5122	1.06092	1.20892		30	9.84570	0.5239	0.46375	1.30584
	15	+9.72531	−0.5081	+1.05088	+1.21474		31	+9.84727	−0.5299	−0.51035	+1.30456
	16	+9.72950	−0.5066	+1.04046	+1.22035		32	+9.84851	−0.5343	−0.55231	+1.30314

E = − 0″.04 = − 0ˢ.003

(CONSTANTS OF PARIS CONFERENCE.)

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)		τ	f	f′	G		H		Log g.	Log h.	i	Log i
			In Time.	In Time.	In Arc.	In Time.	In Arc.	In Time.				
		y	s	s	° ′	h m	° ′	h m			″	
Jan.	0	0.0006	−1.018	−0.008	183 29.7	12 14.0	350 38.6	23 22.6	+0.82562	+1.31004	−1.44	−0.1584
	1	0.0034	1.007	0.010	183 17.8	12 13.2	349 42.2	23 18.8	0.82134	1.30982	1.58	0.1993
	2	0.0061	0.996	0.008	183 6.5	12 12.4	348 45.8	23 15.1	0.81581	1.30957	1.72	0.2366
	3	0.0088	0.985	−0.005	183 0.7	12 12.0	347 49.2	23 11.3	0.80927	1.30931	1.87	0.2708
	4	0.0116	0.974	+0.001	183 3.7	12 12.2	346 52.7	23 7.5	0.80212	1.30902	2.01	0.3024
$(7^{h}.0)$	5	0.0143	−0.963	+0.006	183 16.9	12 13.1	345 56.0	23 3.7	+0.79488	+1.30872	−2.15	−0.3317
	6	0.0170	0.952	0.010	183 39.6	12 14.6	344 59.2	22 59.9	0.78804	1.30839	2.29	0.3590
	7	0.0198	0.941	0.013	184 9.6	12 16.6	344 2.4	22 56.2	0.78198	1.30805	2.42	0.3846
	8	0.0225	0.930	0.013	184 43.9	12 18.9	343 5.5	22 52.4	0.77692	1.30769	2.56	0.4086
	9	0.0252	0.919	0.012	185 19.1	12 21.3	342 8.5	22 48.6	0.77290	1.30731	2.70	0.4313
	10	0.0280	−0.908	+0.008	185 51.9	12 23.5	341 11.3	22 44.8	+0.76981	+1.30691	−2.84	−0.4527
	11	0.0307	0.897	+0.003	186 19.5	12 25.3	340 14.1	22 40.9	0.76741	1.30650	2.97	0.4729
	12	0.0335	0.887	−0.003	186 39.6	12 26.6	339 16.8	22 37.1	0.76537	1.30606	3.10	0.4921
	13	0.0362	0.876	0.009	186 50.9	12 27.4	338 19.3	22 33.3	0.76328	1.30561	3.24	0.5104
	14	0.0389	0.866	0.014	186 53.8	12 27.6	337 21.7	22 29.4	0.76066	1.30515	3.37	0.5278
	15	0.0417	−0.855	−0.017	186 50.0	12 27.3	336 24.1	22 25.6	+0.75696	+1.30467	−3.50	−0.5444
	16	0.0444	0.845	0.017	186 43.6	12 26.9	335 26.3	22 21.8	0.75182	1.30417	3.63	0.5602
	17	0.0472	0.834	0.015	186 40.0	12 26.7	334 28.3	22 17.9	0.74516	1.30366	3.76	0.5754
	18	0.0499	0.824	0.010	186 44.8	12 27.0	333 30.2	22 14.0	0.73721	1.30313	3.89	0.5899
	19	0.0526	0.814	−0.003	187 3.1	12 28.2	332 32.0	22 10.1	0.72851	1.30259	4.02	0.6038
$(8^{h}.0)$	20	0.0554	−0.804	+0.005	187 37.1	12 30.5	331 33.7	22 6.2	+0.71985	+1.30204	−4.14	−0.6172
	21	0.0581	0.794	0.010	188 25.4	12 33.7	330 35.2	22 2.3	0.71215	1.30148	4.26	0.6300
	22	0.0608	0.785	0.013	189 22.2	12 37.5	329 36.5	21 58.4	0.70613	1.30090	4.39	0.6423
	23	0.0636	0.775	0.013	190 19.0	12 41.3	328 37.7	21 54.5	0.70205	1.30032	4.51	0.6541
	24	0.0663	0.765	0.009	191 7.2	12 44.5	327 38.8	21 50.6	0.69960	1.29972	4.63	0.6655
	25	0.0691	−0.755	+0.004	191 40.8	12 46.7	326 39.8	21 46.7	+0.69806	+1.29911	−4.75	−0.6764
	26	0.0718	0.746	−0.002	191 58.4	12 47.9	325 40.6	21 42.7	0.69644	1.29850	4.86	0.6870
	27	0.0745	0.737	0.007	192 3.0	12 48.2	324 41.2	21 38.7	0.69378	1.29788	4.98	0.6971
	28	0.0773	0.727	0.009	192 0.3	12 48.0	323 41.7	21 34.8	0.68954	1.29724	5.09	0.7069
	29	0.0800	0.718	0.008	191 58.4	12 47.9	322 42.0	21 30.8	0.68363	1.29661	5.20	0.7164
	30	0.0828	−0.709	−0.005	192 3.3	12 48.2	321 42.2	21 26.8	+0.67638	+1.29596	−5.32	−0.7255
	31	0.0855	0.700	0.000	192 20.3	12 49.4	320 42.2	21 22.8	0.66840	1.29532	5.42	0.7342
Feb.	1	0.0882	0.691	+0.005	192 51.4	12 51.4	319 42.1	21 18.8	0.66040	1.29466	5.53	0.7427
	2	0.0910	0.682	0.009	193 35.7	12 54.4	318 41.8	21 14.8	0.65309	1.29401	5.64	0.7509
	3	0.0937	0.674	0.013	194 29.9	12 58.0	317 41.3	21 10.8	0.64706	1.29335	5.74	0.7588
$(9^{h}.0)$	4	0.0964	−0.665	+0.014	195 28.8	13 1.9	316 40.7	21 6.7	+0.64260	+1.29269	−5.84	−0.7664
	5	0.0992	0.656	0.013	196 27.6	13 5.8	315 39.9	21 2.7	0.63970	1.29202	5.94	0.7737
	6	0.1019	0.648	0.010	197 21.5	13 9.4	314 38.9	20 58.6	0.63810	1.29136	6.04	0.7808
	7	0.1046	0.640	+0.005	198 6.9	13 12.5	313 37.8	20 54.5	0.63742	1.29070	6.13	0.7876
	8	0.1074	0.631	−0.001	198 41.1	13 14.7	312 36.5	20 50.4	0.63715	1.29004	6.23	0.7942
	9	0.1101	−0.623	−0.007	199 3.5	13 16.2	311 35.1	20 46.3	+0.63670	+1.28938	−6.32	−0.8006
	10	0.1129	0.615	0.012	199 14.9	13 17.0	310 33.5	20 42.2	0.63544	1.28872	6.41	0.8067
	11	0.1156	0.607	0.016	199 18.1	13 17.2	309 31.7	20 38.1	0.63277	1.28808	6.50	0.8126
	12	0.1183	0.600	0.018	199 18.4	13 17.2	308 29.7	20 34.0	0.62833	1.28743	6.58	0.8183
	13	0.1211	0.592	0.016	199 22.9	13 17.5	307 27.6	20 29.8	0.62201	1.28678	6.66	0.8238
	14	0.1238	−0.584	−0.012	199 39.2	13 18.6	306 25.3	20 25.7	+0.61409	+1.28615	−6.75	−0.8291
	15	0.1266	−0.576	−0.006	200 13.0	13 20.9	305 22.9	20 21.5	+0.60533	+1.28552	−6.83	−0.8342

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)	τ	*f*	*f'*	*G*		*H*		Log *g*.	Log *h*.	*i*	Log *i*.
		In Time.	In Time.	In Arc.	In Time.	In Arc.	In Time.				
	y	s	s	° ′	h m	° ′	h m			″	
Feb. 15	0.1266	−0.576	−0.006	200 13.0	13 20.9	305 22.9	20 21.5	+0.60533	+1.28552	−6.83	−0.8342
16	0.1293	0.569	+0.001	201 7.3	13 24.5	304 20.3	20 17.4	0.59686	1.28490	6.90	0.8390
17	0.1320	0.561	0.008	202 19.2	13 29.3	303 17.5	20 13.2	0.58991	1.28429	6.98	0.8437
18	0.1348	0.554	0.011	203 40.8	13 34.7	302 14.6	20 9.0	0.58532	1.28369	7.05	0.8482
19	0.1375	0.547	0.012	205 0.2	13 40.0	301 11.6	20 4.8	0.58331	1.28310	7.12	0.8526
h (10.0) 20	0.1402	−0.540	+0.010	206 6.4	13 44.4	300 8.4	20 0.6	+0.58338	+1.28252	−7.19	−0.8567
21	0.1430	0.533	+0.005	206 52.0	13 47.5	299 5.0	19 56.3	0.58431	1.28196	7.26	0.8607
22	0.1457	0.526	−0.001	207 16.0	13 49.1	298 1.6	19 52.1	0.58473	1.28140	7.32	0.8645
23	0.1485	0.519	0.005	207 23.7	13 49.6	296 58.0	19 47.9	0.58353	1.28086	7.38	0.8682
24	0.1512	0.512	0.008	207 22.2	13 49.5	295 54.3	19 43.6	0.58014	1.28034	7.44	0.8716
25	0.1539	−0.505	−0.008	207 22.2	13 49.5	294 50.4	19 39.4	+0.57453	+1.27983	−7.50	−0.8750
26	0.1567	0.499	0.006	207 31.9	13 50.1	293 46.5	19 35.1	0.56726	1.27934	7.55	0.8781
27	0.1594	0.492	−0.001	207 57.4	13 51.8	292 42.4	19 30.8	0.55922	1.27886	7.60	0.8811
28	0.1622	0.485	+0.004	208 40.5	13 54.7	291 38.3	19 26.6	0.55146	1.27840	7.66	0.8840
Mar. 1	0.1649	0.479	0.009	209 38.8	13 58.6	290 34.0	19 22.3	0.54504	1.27796	7.70	0.8866
2	0.1676	−0.472	+0.013	210 47.1	14 3.1	289 29.7	19 18.0	+0.54053	+1.27754	−7.75	−0.8892
3	0.1704	0.466	0.014	211 57.9	14 7.9	288 25.3	19 13.7	0.53818	1.27714	7.79	0.8916
4	0.1731	0.460	0.014	213 4.8	14 12.3	287 20.8	19 9.4	0.53780	1.27676	7.83	0.8938
5	0.1758	0.453	0.011	214 1.7	14 16.1	286 16.2	19 5.1	0.53891	1.27639	7.87	0.8959
6	0.1786	0.447	0.007	214 45.8	14 19.1	285 11.6	19 0.8	0.54077	1.27605	7.90	0.8979
h (11.0) 7	0.1813	−0.441	+0.002	215 15.4	14 21.0	284 6.8	18 56.5	+0.54270	+1.27573	−7.94	−0.8997
8	0.1840	0.435	−0.005	215 31.0	14 22.1	283 2.1	18 52.1	0.54390	1.27543	7.97	0.9014
9	0.1868	0.429	0.010	215 34.1	14 22.3	281 57.3	18 47.8	0.54381	1.27516	8.00	0.9029
10	0.1895	0.422	0.015	215 29.8	14 22.0	280 52.4	18 43.5	0.54180	1.27490	8.02	0.9043
11	0.1923	0.416	0.017	215 23.7	14 21.6	279 47.5	18 39.2	0.53761	1.27467	8.05	0.9056
12	0.1950	−0.410	−0.017	215 24.4	14 21.6	278 42.5	18 34.8	+0.53122	+1.27447	−8.07	−0.9067
13	0.1977	0.404	0.014	215 40.2	14 22.7	277 37.5	18 30.5	0.52309	1.27428	8.09	0.9077
14	0.2005	0.398	0.008	216 17.1	14 25.1	276 32.5	18 26.2	0.51434	1.27412	8.10	0.9086
15	0.2032	0.392	−0.002	217 18.3	14 29.2	275 27.5	18 21.8	0.50622	1.27399	8.12	0.9093
16	0.2060	0.386	+0.005	218 38.7	14 34.6	274 22.5	18 17.4	0.50022	1.27388	8.13	0.9099
17	0.2087	−0.380	+0.009	220 7.7	14 40.5	273 17.5	18 13.2	+0.49723	+1.27380	−8.14	−0.9104
18	0.2114	0.374	0.011	221 31.8	14 46.1	272 12.5	18 8.8	0.49725	1.27373	8.14	0.9107
19	0.2142	0.369	0.010	222 37.9	14 50.5	271 7.5	18 4.5	0.49937	1.27369	8.14	0.9109
20	0.2169	0.363	+0.006	223 19.2	14 53.3	270 2.5	18 0.2	0.50189	1.27368	8.15	0.9110
21	0.2196	0.357	0.000	223 36.1	14 54.4	268 57.5	17 55.8	0.50320	1.27369	8.14	0.9109
h (12.0) 22	0.2224	−0.351	−0.005	223 35.1	14 54.3	267 52.7	17 51.5	+0.50206	+1.27372	−8.14	−0.9107
23	0.2251	0.345	0.008	223 25.8	14 53.7	266 47.9	17 47.2	0.49795	1.27378	8.14	0.9104
24	0.2279	0.339	0.009	223 20.6	14 53.4	265 43.2	17 42.9	0.49084	1.27387	8.13	0.9100
25	0.2306	0.333	0.007	223 29.5	14 54.0	264 38.5	17 38.6	0.48166	1.27398	8.12	0.9094
26	0.2333	0.327	−0.003	223 57.9	14 55.9	263 33.8	17 34.3	0.47166	1.27411	8.10	0.9087
27	0.2361	−0.321	+0.003	224 47.9	14 59.2	262 29.3	17 30.0	+0.46234	+1.27427	−8.09	−0.9078
28	0.2388	0.315	0.008	225 55.5	15 3.7	261 24.9	17 25.7	0.45482	1.27444	8.07	0.9068
29	0.2415	0.309	0.012	227 12.3	15 8.8	260 20.5	17 21.4	0.44998	1.27465	8.05	0.9057
30	0.2443	0.303	0.015	228 29.3	15 14.0	259 16.3	17 17.1	0.44784	1.27487	8.03	0.9045
31	0.2470	0.296	0.015	229 37.2	15 18.5	258 12.2	17 12.8	0.44807	1.27512	8.00	0.9031
Apr. 1	0.2498	−0.290	+0.013	230 31.8	15 22.1	257 8.2	17 8.5	+0.44969	+1.27539	−7.97	−0.9016
2	0.2525	−0.284	+0.009	231 10.0	15 24.7	256 4.3	17 4.3	+0.45181	+1.27568	−7.94	−0.9000

(CONSTANTS OF PARIS CONFERENCE.)

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)		τ	f′	f″	G		H		Log g.	Log h.	i	Log i.
			In Time.	In Time.	In Arc.	In Time.	In Arc.	In Time.				
		y	s	s	° ′	h m	° ′	h m			″	
Apr.	1	0.2498	−0.290	+0.013	230 31.8	15 22.1	257 8.2	17 8.5	+0.44969	+1.27539	−7.97	−0.9016
	2	0.2525	0.284	0.009	231 10.0	15 24.7	256 4.3	17 4.3	0.45181	1.27568	7.94	0.9000
	3	0.2552	0.278	+0.004	231 31.2	15 26.1	255 0.5	17 0.0	0.45353	1.27599	7.91	0.8982
	4	0.2580	0.271	−0.002	231 37.7	15 26.5	253 56.9	16 55.8	0.45398	1.27632	7.88	0.8964
h	5	0.2607	0.265	0.008	231 32.9	15 26.2	252 53.4	16 51.6	0.45247	1.27667	7.84	0.8943
(13.0)	6	0.2634	−0.259	−0.013	231 22.3	15 25.5	251 50.1	16 47.3	+0.44847	+1.27704	−7.80	−0.8921
	7	0.2662	0.252	0.016	231 13.7	15 24.9	250 46.9	16 43.1	0.44165	1.27744	7.76	0.8898
	8	0.2689	0.246	0.017	231 16.0	15 25.1	249 43.8	16 38.9	0.43228	1.27784	7.72	0.8874
	9	0.2717	0.239	0.014	231 39.0	15 26.6	248 40.9	16 34.7	0.42100	1.27827	7.67	0.8848
	10	0.2744	0.233	0.010	232 29.5	15 30.0	247 38.2	16 30.5	0.40921	1.27871	7.62	0.8820
	11	0.2771	−0.226	−0.003	233 50.1	15 35.3	246 35.6	16 26.4	+0.39862	+1.27917	−7.57	−0.8792
	12	0.2799	0.219	+0.003	235 34.4	15 42.3	245 33.2	16 22.2	0.39114	1.27965	7.52	0.8762
	13	0.2826	0.213	0.008	237 25.9	15 49.7	244 31.0	16 18.1	0.38777	1.28014	7.46	0.8730
	14	0.2854	0.206	0.011	239 8.4	15 56.6	243 28.9	16 13.9	0.38835	1.28064	7.41	0.8697
	15	0.2881	0.199	0.010	240 27.3	16 1.8	242 27.0	16 9.8	0.39112	1.28116	7.35	0.8662
	16	0.2908	−0.192	+0.006	241 16.0	16 5.1	241 25.3	16 5.7	+0.39405	+1.28169	−7.29	−0.8626
	17	0.2936	0.185	+0.001	241 37.0	16 6.5	240 23.7	16 1.6	0.39487	1.28224	7.22	0.8588
	18	0.2963	0.178	−0.005	241 40.6	16 6.7	239 22.4	15 57.5	0.39204	1.28279	7.16	0.8548
	19	0.2990	0.170	0.009	241 42.1	16 6.8	238 21.2	15 53.4	0.38479	1.28336	7.09	0.8507
h	20	0.3018	0.163	0.011	241 54.5	16 7.6	237 20.3	15 49.4	0.37364	1.28393	7.02	0.8465
(14.0)	21	0.3045	−0.156	−0.009	242 31.0	16 10.1	236 19.5	15 45.3	+0.35985	+1.28452	−6.95	−0.8420
	22	0.3072	0.148	−0.005	243 38.9	16 14.6	235 18.9	15 41.3	0.34524	1.28511	6.88	0.8374
	23	0.3100	0.141	0.000	245 18.6	16 21.2	234 18.6	15 37.2	0.33204	1.28571	6.80	0.8327
	24	0.3127	0.133	+0.006	247 20.7	16 29.4	233 18.4	15 33.2	0.32221	1.28632	6.72	0.8277
	25	0.3155	0.125	0.011	249 30.3	16 38.0	232 18.4	15 29.2	0.31665	1.28693	6.65	0.8226
	26	0.3182	−0.118	+0.015	251 33.6	16 46.2	231 18.7	15 25.2	+0.31512	+1.28755	−6.56	−0.8172
	27	0.3209	0.110	0.016	253 18.6	16 53.2	230 19.2	15 21.3	0.31663	1.28817	6.48	0.8117
	28	0.3237	0.102	0.014	254 39.8	16 58.7	229 19.8	15 17.3	0.31959	1.28880	6.40	0.8060
	29	0.3264	0.094	0.011	255 37.8	17 2.5	228 20.7	15 13.4	0.32255	1.28943	6.31	0.8001
	30	0.3292	0.086	+0.006	256 17.2	17 5.1	227 21.7	15 9.4	0.32420	1.29006	6.22	0.7940
May	1	0.3319	−0.078	0.000	256 41.5	17 6.8	226 23.0	15 5.5	+0.32360	+1.29069	−6.13	−0.7877
	2	0.3346	0.069	−0.006	257 1.3	17 8.1	225 24.5	15 1.6	0.32004	1.29133	6.04	0.7812
	3	0.3374	0.061	0.011	257 22.4	17 9.5	224 26.2	14 57.7	0.31305	1.29196	5.95	0.7744
	4	0.3401	0.052	0.015	257 59.5	17 12.0	223 28.1	14 53.9	0.30273	1.29259	5.85	0.7674
h	5	0.3428	0.044	0.016	259 2.1	17 16.1	222 30.2	14 50.0	0.28974	1.29322	5.76	0.7602
(15.0)	6	0.3456	−0.035	−0.015	260 41.2	17 22.7	221 32.4	14 46.2	+0.27568	+1.29385	−5.66	−0.7528
	7	0.3483	0.026	0.010	263 3.1	17 32.2	220 34.9	14 42.3	0.26308	1.29448	5.56	0.7450
	8	0.3511	0.018	−0.005	265 59.4	17 44.0	219 37.5	14 38.5	0.25472	1.29510	5.46	0.7371
	9	0.3538	−0.009	+0.002	269 11.5	17 56.8	218 40.4	14 34.7	0.25277	1.29572	5.36	0.7288
	10	0.3565	0.000	0.007	272 11.9	18 8.8	217 43.4	14 30.9	0.25728	1.29633	5.25	0.7203
	11	0.3593	+0.009	+0.011	274 39.0	18 18.6	216 46.6	14 27.1	+0.26646	+1.29694	−5.15	−0.7114
	12	0.3620	0.018	0.011	276 22.4	18 25.5	215 50.0	14 23.3	0.27699	1.29755	5.04	0.7023
	13	0.3648	0.028	0.008	277 27.8	18 29.9	214 53.5	14 19.6	0.28573	1.29815	4.93	0.6929
	14	0.3675	0.037	+0.003	278 11.0	18 32.7	213 57.3	14 15.8	0.29018	1.29873	4.82	0.6831
	15	0.3702	0.046	−0.003	278 51.5	18 35.4	213 1.2	14 12.1	0.28946	1.29931	4.71	0.6729
	16	0.3730	+0.056	−0.008	279 50.0	18 39.3	212 5.3	14 8.4	+0.28390	+1.29988	−4.60	−0.6624
	17	0.3757	+0.065	−0.011	281 24.0	18 45.6	211 9.5	14 4.6	+0.27516	+1.30044	−4.48	−0.6516

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)	τ	f	f′	G		H		Log g.	Log h.	i	Log i.
		In Time.	In Time.	In Arc.	In Time.	In Arc.	In Time.				
	y	s	s	° ′	h m	° ′	h m			″	
May 17	0.3757	+0.065	−0.011	281 24.0	18 45.6	211 9.5	14 4.6	+0.27516	+1.30044	−4.48	−0.6516
18	0.3784	0.075	0.011	283 40.6	18 54.7	210 13.9	14 0.9	0.26597	1.30100	4.37	0.6403
19	0.3812	0.085	0.008	286 36.4	19 6.4	209 18.5	13 57.2	0.25961	1.30154	4.25	0.6286
20	0.3839	0.095	−0.003	289 54.6	19 19.6	208 23.2	13 53.5	0.25841	1.30207	4.14	0.6164
21	0.3866	0.104	+0.004	293 11.3	19 32.8	207 28.0	13 49.9	0.26347	1.30259	4.02	0.6038
$^{\mathrm{h}}$(16.0) 22	0.3894	+0.114	+0.009	296 2.1	19 44.1	206 33.1	13 46.2	+0.27361	+1.30310	−3.90	−0.5907
23	0.3921	0.124	0.013	298 16.0	19 53.1	205 38.3	13 42.6	0.28665	1.30360	3.78	0.5771
24	0.3949	0.134	0.015	299 52.1	19 59.5	204 43.6	13 38.9	0.30047	1.30408	3.66	0.5628
25	0.3976	0.144	0.015	300 57.0	20 3.8	203 49.1	13 35.3	0.31313	1.30456	3.53	0.5480
26	0.4003	0.154	0.012	301 40.5	20 6.7	202 54.7	13 31.6	0.32358	1.30501	3.41	0.5326
27	0.4031	+0.165	+0.008	302 13.8	20 8.9	202 0.4	13 28.0	+0.33136	+1.30545	−3.28	−0.5164
28	0.4058	0.175	+0.002	302 46.4	20 11.1	201 6.3	13 24.4	0.33640	1.30588	3.16	0.4996
29	0.4086	0.185	−0.004	303 27.9	20 13.9	200 12.3	13 20.8	0.33886	1.30630	3.03	0.4819
30	0.4113	0.196	0.009	304 25.6	20 17.7	199 18.4	13 17.2	0.33921	1.30670	2.91	0.4633
31	0.4140	0.206	0.014	305 47.7	20 23.2	198 24.6	13 13.6	0.33861	1.30708	2.78	0.4438
June 1	0.4168	+0.217	−0.016	307 36.8	20 30.5	197 31.0	13 10.1	+0.33856	+1.30745	−2.65	−0.4233
2	0.4195	0.228	0.015	309 50.2	20 39.3	196 37.5	13 6.5	0.34085	1.30780	2.52	0.4016
3	0.4222	0.238	0.012	312 16.2	20 49.1	195 44.0	13 2.9	0.34699	1.30813	2.39	0.3787
4	0.4250	0.249	−0.006	314 37.9	20 58.5	194 50.7	12 59.4	0.35773	1.30845	2.26	0.3543
5	0.4277	0.260	+0.001	316 37.8	21 6.5	193 57.4	12 55.9	0.37255	1.30875	2.13	0.3284
$^{\mathrm{h}}$(17.0) 6	0.4305	+0.270	+0.007	318 3.0	21 12.2	193 4.2	12 52.3	+0.38966	+1.30904	−2.00	−0.3007
7	0.4332	0.281	0.011	318 51.8	21 15.5	192 11.1	12 48.7	0.40688	1.30930	1.87	0.2710
8	0.4359	0.292	0.012	319 10.2	21 16.7	191 18.1	12 45.2	0.42218	1.30955	1.73	0.2390
9	0.4387	0.303	0.010	319 12.6	21 16.8	190 25.1	12 41.7	0.43431	1.30979	1.60	0.2044
10	0.4414	0.313	+0.005	319 12.6	21 16.8	189 32.2	12 38.1	0.44269	1.31000	1.47	0.1666
11	0.4442	+0.324	−0.001	319 25.2	21 17.7	188 39.4	12 34.6	+0.44762	+1.31020	−1.33	−0.1250
12	0.4469	0.335	0.007	320 1.2	21 20.1	187 46.6	12 31.1	0.45039	1.31037	1.20	0.0790
13	0.4496	0.346	0.011	321 5.1	21 24.3	186 53.8	12 27.5	0.45279	1.31053	1.06	0.0273
14	0.4524	0.357	0.012	322 32.8	21 30.2	186 1.1	12 24.1	0.45663	1.31067	0.93	9.9686
15	0.4551	0.368	0.010	324 12.0	21 36.8	185 8.5	12 20.6	0.46319	1.31079	0.80	9.9002
16	0.4578	+0.379	−0.005	325 49.1	21 43.3	184 15.8	12 17.1	+0.47299	+1.31089	−0.66	−9.8195
17	0.4606	0.390	+0.001	327 10.4	21 48.7	183 23.2	12 13.5	0.48538	1.31098	0.52	9.7197
18	0.4633	0.401	0.007	328 8.5	21 52.6	182 30.7	12 10.0	0.49917	1.31104	0.39	9.5899
19	0.4660	0.412	0.012	328 42.5	21 54.8	181 38.1	12 6.5	0.51306	1.31110	0.25	9.4037
20	0.4688	0.423	0.015	328 55.8	21 55.7	180 45.6	12 3.0	0.52587	1.31111	−0.12	−9.0707
$^{\mathrm{h}}$(18.0) 21	0.4715	+0.434	+0.015	328 54.8	21 55.7	179 53.0	11 59.5	+0.53700	+1.31112	+0.02	+8.2550
22	0.4743	0.445	0.013	328 47.0	21 55.1	179 0.5	11 56.0	0.54625	1.31111	0.15	9.1865
23	0.4770	0.456	0.009	328 37.7	21 54.5	178 8.0	11 52.6	0.55354	1.31108	0.29	9.4612
24	0.4797	0.467	+0.004	328 32.9	21 54.2	177 15.5	11 49.0	0.55912	1.31103	0.42	9.6281
25	0.4825	0.478	−0.002	328 37.2	21 54.5	176 23.0	11 45.5	0.56339	1.31096	0.56	9.7482
26	0.4852	+0.489	−0.008	328 53.5	21 55.6	175 30.4	11 42.0	+0.56691	+1.31087	+0.70	+9.8421
27	0.4880	0.500	0.013	329 23.7	21 57.6	174 37.9	11 38.5	0.57024	1.31076	0.83	9.9192
28	0.4907	0.511	0.016	330 7.4	22 0.5	173 45.3	11 35.0	0.57414	1.31064	0.97	9.9844
29	0.4934	0.522	0.016	331 1.5	22 4.1	172 52.7	11 31.5	0.57954	1.31049	1.10	0.0411
30	0.4962	0.533	0.013	331 59.1	22 7.9	172 0.1	11 28.0	0.58696	1.31033	1.23	0.0911
July 1	0.4989	+0.544	−0.008	332 51.8	22 11.5	171 7.4	11 24.5	+0.59654	+1.31015	+1.37	+0.1358
2	0.5016	+0.555	−0.002	333 31.2	22 14.1	170 14.7	11 21.0	+0.60785	+1.30995	+1.50	+0.1762

(CONSTANTS OF PARIS CONFERENCE.)

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)		τ	*f*	*f′*	*G*		*H*		Log *g*.	Log *h*.	*i*	Log *i*.
			In Time.	In Time.	In Arc.	In Time.	In Arc.	In Time.				
		y	s	s	° ′	h m	° ′	h m			″	
July	1	0.4989	+0.544	−0.008	332 51.8	22 11.5	171 7.4	11 24.5	+0.59654	+1.31015	+1.37	+0.1358
	2	0.5016	0.555	−0.002	333 31.2	22 14.1	170 14.7	11 21.0	0.60785	1.30995	1.50	0.1762
	3	0.5044	0.566	+0.005	333 52.1	22 15.5	169 21.9	11 17.5	0.61995	1.30973	1.63	0.2131
	4	0.5071	0.577	0.010	333 53.5	22 15.6	168 29.1	11 13.9	0.63185	1.30950	1.77	0.2470
	5	0.5099	0.588	0.013	333 39.2	22 14.6	167 36.3	11 10.4	0.64243	1.30924	1.90	0.2783
h	6	0.5126	+0.598	+0.012	333 16.4	22 13.1	166 43.3	11 6.9	+0.65098	+1.30897	+2.03	+0.3074
(19.0)	7	0.5153	0.609	0.008	332 54.3	22 11.6	165 50.3	11 3.4	0.65729	1.30869	2.16	0.3346
	8	0.5181	0.620	+0.002	332 40.9	22 10.7	164 57.2	10 59.8	0.66155	1.30838	2.29	0.3600
	9	0.5208	0.630	−0.004	332 42.5	22 10.8	164 4.0	10 56.3	0.66451	1.30806	2.42	0.3839
	10	0.5236	0.641	0.009	333 1.4	22 12.1	163 10.7	10 52.7	0.66719	1.30772	2.55	0.4065
	11	0.5263	+0.652	−0.011	333 34.8	22 14.3	162 17.4	10 49.2	+0.67062	+1.30737	+2.68	+0.4278
	12	0.5290	0.662	0.010	334 16.5	22 17.1	161 23.9	10 45.6	0.67558	1.30700	2.81	0.4481
	13	0.5318	0.673	0.007	334 57.9	22 19.9	160 30.3	10 42.0	0.68236	1.30662	2.93	0.4673
	14	0.5345	0.683	−0.001	335 31.2	22 22.1	159 36.7	10 38.4	0.69066	1.30621	3.06	0.4856
	15	0.5372	0.693	+0.005	335 51.4	22 23.4	158 42.9	10 34.9	0.69980	1.30580	3.18	0.5030
	16	0.5400	+0.704	+0.010	335 57.2	22 23.8	157 49.0	10 31.3	+0.70904	+1.30537	+3.31	+0.5197
	17	0.5427	0.714	0.014	335 50.3	22 23.4	156 55.0	10 27.7	0.71760	1.30493	3.43	0.5356
	18	0.5454	0.724	0.015	335 34.9	22 22.3	156 0.9	10 24.1	0.72514	1.30447	3.56	0.5508
	19	0.5482	0.734	0.014	335 14.9	22 21.0	155 6.7	10 20.4	0.73140	1.30399	3.68	0.5654
	20	0.5509	0.744	0.010	334 54.4	22 19.6	154 12.3	10 16.8	0.73636	1.30351	3.80	0.5795
h	21	0.5537	+0.754	+0.005	334 37.3	22 18.5	153 17.8	10 13.2	+0.74017	+1.30302	+3.92	+0.5929
(20.0)	22	0.5564	0.764	−0.001	334 26.2	22 17.7	152 23.1	10 9.5	0.74311	1.30251	4.04	0.6059
	23	0.5591	0.773	0.007	334 23.3	22 17.5	151 28.4	10 5.9	0.74547	1.30199	4.15	0.6183
	24	0.5619	0.783	0.012	334 29.5	22 18.0	150 33.5	10 2.2	0.74764	1.30146	4.27	0.6303
	25	0.5646	0.793	0.015	334 45.1	22 19.0	149 38.4	9 58.6	0.75014	1.30092	4.38	0.6419
	26	0.5674	+0.802	−0.017	335 8.1	22 20.5	148 43.2	9 54.9	+0.75346	+1.30037	+4.50	+0.6530
	27	0.5701	0.812	0.015	335 34.7	22 22.3	147 47.9	9 51.2	0.75796	1.29981	4.61	0.6638
	28	0.5728	0.821	0.011	335 59.9	22 24.0	146 52.4	9 47.5	0.76385	1.29924	4.72	0.6741
	29	0.5756	0.831	−0.005	336 18.5	22 25.2	145 56.7	9 43.8	0.77096	1.29867	4.83	0.6841
	30	0.5783	0.840	+0.002	336 26.0	22 25.7	145 0.9	9 40.1	0.77888	1.29809	4.94	0.6938
	31	0.5810	+0.849	+0.008	336 20.8	22 25.4	144 4.9	9 36.3	+0.78689	+1.29749	+5.05	+0.7032
Aug.	1	0.5838	0.858	0.012	336 4.3	22 24.3	143 8.8	9 32.6	0.79419	1.29689	5.15	0.7122
	2	0.5865	0.867	0.012	335 40.9	22 22.7	142 12.5	9 28.8	0.80033	1.29629	5.26	0.7209
	3	0.5893	0.876	0.010	335 16.2	22 21.1	141 16.0	9 25.1	0.80487	1.29568	5.36	0.7293
	4	0.5920	0.885	+0.005	334 56.4	22 19.8	140 19.3	9 21.3	0.80788	1.29507	5.46	0.7375
h	5	0.5947	+0.894	−0.001	334 46.6	22 19.1	139 22.5	9 17.5	+0.80979	+1.29445	+5.56	+0.7454
(21.0)	6	0.5975	0.902	0.007	334 49.4	22 19.3	138 25.5	9 13.7	0.81125	1.29383	5.66	0.7530
	7	0.6002	0.911	0.010	335 3.8	22 20.3	137 28.2	9 9.9	0.81303	1.29321	5.76	0.7604
	8	0.6030	0.920	0.010	335 26.1	22 21.7	136 30.8	9 6.1	0.81569	1.29258	5.86	0.7676
	9	0.6057	0.928	0.007	335 50.6	22 23.4	135 33.2	9 2.2	0.81960	1.29195	5.95	0.7745
	10	0.6084	+0.936	−0.002	336 11.3	22 24.8	134 35.5	8 58.4	+0.82473	+1.29132	+6.04	+0.7812
	11	0.6112	0.945	+0.004	336 23.6	22 25.6	133 37.5	8 54.5	0.83062	1.29070	6.13	0.7876
	12	0.6139	0.953	0.009	336 25.5	22 25.7	132 39.3	8 50.6	0.83681	1.29007	6.22	0.7939
	13	0.6166	0.961	0.013	336 17.9	22 25.2	131 41.0	8 46.7	0.84267	1.28944	6.31	0.8000
	14	0.6194	0.969	0.015	336 3.0	22 24.2	130 42.4	8 42.8	0.84785	1.28882	6.40	0.8058
	15	0.6221	+0.977	+0.015	335 43.9	22 22.9	129 43.7	8 38.9	+0.85215	+1.28820	+6.48	+0.8115
	16	0.6248	+0.985	+0.012	335 23.9	22 21.6	128 44.7	8 35.0	+0.85544	+1.28758	+6.56	+0.8169

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)		τ	f	f′	G		H		Log g.	Log h.	i	Log i.
			In Time.	In Time.	In Arc.	In Time	In Arc.	In Time.				
		y	s	s	° ′	h m	° ′	h m			″	
Aug.	16	0.6248	+0.985	+0.012	335 23.9	22 21.6	128 44.7	8 35.0	+0.85544	+1.28758	+6.56	+0.8169
	17	0.6276	0.993	0.007	335 6.0	22 20.4	127 45.6	8 31.0	0.85786	1.28697	6.64	0.8222
	18	0.6303	1.000	+0.001	334 52.4	22 19.5	126 46.3	8 27.1	0.85952	1.28636	6.72	0.8273
	19	0.6331	1.008	−0.005	334 44.8	22 19.0	125 46.8	8 23.1	0.86066	1.28576	6.80	0.8322
h	20	0.6358	1.016	0.010	334 44.3	22 19.0	124 47.2	8 19.1	0.86158	1.28517	6.87	0.8370
(22.0)	21	0.6385	+1.023	−0.015	334 51.2	22 19.4	123 47.3	8 15.2	+0.86261	+1.28458	+6.94	+0.8415
	22	0.6413	1.031	0.017	335 4.5	22 20.3	122 47.3	8 11.2	0.86411	1.28400	7.01	0.8459
	23	0.6440	1.038	0.016	335 21.9	22 21.5	121 47.0	8 7.1	0.86643	1.28343	7.08	0.8502
	24	0.6468	1.045	0.013	335 40.1	22 22.7	120 46.6	8 3.1	0.86981	1.28287	7.15	0.8542
	25	0.6495	1.053	0.008	335 54.7	22 23.6	119 46.1	7 59.1	0.87421	1.28232	7.21	0.8582
	26	0.6522	+1.060	−0.001	336 2.2	22 24.1	118 45.3	7 55.0	+0.87943	+1.28178	+7.28	+0.8619
	27	0.6550	1.067	+0.005	336 0.4	22 24.0	117 44.4	7 51.0	0.88496	1.28126	7.34	0.8655
	28	0.6577	1.074	0.010	335 49.1	22 23.3	116 43.3	7 46.9	0 89021	1.28074	7.40	0.8690
	29	0.6604	1.081	0.011	335 31.1	22 22.1	115 42.0	7 42.8	0.89469	1.28024	7.45	0.8723
	30	0.6632	1.088	0.010	335 10.7	22 20.7	114 40.6	7 38.7	0.89803	1.27975	7.51	0.8755
	31	0.6659	+1.094	+0.006	334 52.8	22 19.5	113 39.0	7 34.6	+0.90012	+1.27928	+7.56	+0.8785
Sept.	1	0.6687	1.101	0.000	334 41.9	22 18.8	112 37.3	7 30.5	0.90122	1.27882	7.61	0.8814
	2	0.6714	1.108	−0.005	334 40.9	22 18.7	111 35.3	7 26.4	0.90175	1.27838	7.66	0.8841
	3	0.6741	1.114	0.009	334 50.3	22 19.4	110 33.2	7 22.2	0.90232	1.27796	7.70	0.8867
h	4	0.6769	1.121	0.010	335 7.8	22 20.5	109 31.0	7 18.1	0.90347	1.27755	7.75	0.8891
(23.0)	5	0.6796	+1.127	−0.008	335 29.0	22 21.9	108 28.6	7 13.9	+0.90560	+1.27716	+7.79	+0.8915
	6	0.6824	1.134	−0.004	335 48.7	22 23.2	107 26.1	7 9.7	0.90874	1.27679	7.83	0.8936
	7	0.6851	1.141	+0.003	336 3.1	22 24.2	106 23.5	7 5.6	0.91268	1.27643	7.86	0.8957
	8	0.6878	1.147	0.009	336 9.4	22 24.6	105 20.7	7 1.4	0.91702	1.27610	7.90	0.8976
	9	0.6906	1.153	0.013	336 7.2	22 24.5	104 17.7	6 57.2	0.92127	1.27578	7.93	0.8994
	10	0.6933	+1.160	+0.016	335 58.3	22 23.9	103 14.7	6 53.0	+0.92506	+1.27549	+7.96	+0.9011
	11	0.6960	1.166	0.016	335 44.9	22 23.0	102 11.5	6 48.8	0.92814	1.27522	7.99	0.9026
	12	0.6988	1.172	0.013	335 30.2	22 22.0	101 8.2	6 44.5	0.93042	1.27496	8.02	0.9040
	13	0.7015	1.178	0.009	335 16.5	22 21.1	100 4.8	6 40.3	0.93192	1.27473	8.04	0.9053
	14	0.7042	1.185	+0.003	335 6.2	22 20.4	99 1.3	6 36.1	0.93276	1.27452	8.06	0.9064
	15	0.7070	+1.191	−0.003	335 0.9	22 20.1	97 57.7	6 31.8	+0.93311	+1.27434	+8.08	+0.9074
	16	0.7097	1.197	0.008	335 1.6	22 20.1	96 54.0	6 27.6	0.93320	1.27417	8.10	0.9083
	17	0.7125	1.203	0.013	335 8.6	22 20.6	95 50.3	6 23.4	0.93331	1.27403	8.11	0.9091
	18	0.7152	1.210	0.016	335 21.7	22 21.4	94 46.5	6 19.1	0.93376	1.27391	8.12	0.9097
	19	0.7179	1.216	0.016	335 39.1	22 22.6	93 42.6	6 14.8	0.93484	1.27382	8.13	0.9102
h	20	0.7207	+1.222	−0.014	335 58.2	22 23.9	92 38.6	6 10.6	+0.93676	+1.27375	+8.14	+0.9106
(0.0)	21	0.7234	1.228	0.010	336 15.4	22 25.0	91 34.6	6 6.3	0.93959	1.27370	8.14	0.9108
	22	0.7262	1.234	−0.004	336 27.7	22 25.8	90 30.6	6 2.0	0.94322	1.27368	8.15	0.9110
	23	0.7289	1.240	+0.003	336 32.5	22 26.2	89 26.5	5 57.8	0.94728	1.27368	8.15	0.9110
	24	0.7316	1.246	0.008	336 29.1	22 25.9	88 22.4	5 53.5	0.95130	1.27370	8.14	0.9108
	25	0.7344	+1.252	+0.010	336 19.1	22 25.3	87 18.3	5 49.2	+0.95482	+1.27375	+8.14	+0.9106
	26	0.7371	1.258	0.010	336 5.6	22 24.4	86 14.2	5 44.9	0.95749	1.27382	8.13	0.9102
	27	0.7398	1.264	0.006	335 53.1	22 23.5	85 10.1	5 40.7	0.95912	1.27392	8.12	0.9097
	28	0.7426	1.270	+0.001	335 45.8	22 23.1	84 6.0	5 36.4	0.95982	1.27404	8.11	0.9090
	29	0.7453	1.277	−0.005	335 47.0	22 23.1	83 1.8	5 32.1	0.95994	1.27418	8.10	0.9083
	30	0.7481	+1.283	−0.009	335 57.7	22 23.8	81 57.7	5 27.8	+0.95997	+1.27435	+8.08	+0.9074
Oct.	1	0.7508	+1.289	−0.011	336 16.4	22 25.1	80 53.6	5 23.6	+0.96045	+1.27454	+8.06	+0.9063

(CONSTANTS OF PARIS CONFERENCE.)

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)		τ	f′	f″	G		H		Log g.	Log h.	i	Log i.
			In Time.	In Time.	In Arc.	In Time.	In Arc.	In Time.				
		y	s	s	° ′	h m	° ′	h m			″	
Oct.	1	0.7508	+1.289	−0.011	336 16.4	22 25.1	80 53.6	5 23.6	+0.96045	+1.27454	+8.06	+0.9063
	2	0.7535	1.296	0.010	336 40.0	22 26.7	79 49.5	5 19.3	0.96174	1.27475	8.04	0.9052
	3	0.7563	1.302	−0.005	337 3.9	22 28.3	78 45.4	5 15.0	0.96396	1.27496	8.01	0.9039
	4	0.7590	1.308	+0.001	337 23.6	22 29.6	77 41.4	5 10.8	0.96700	1.27525	7.99	0.9024
	5	0.7618	1.314	0.007	337 36.8	22 30.5	76 37.4	5 6.5	0.97054	1.27553	7.96	0.9009
h (1.0)	6	0.7645	+1.321	+0.013	337 42.2	22 30.8	75 33.4	5 2.2	+0.97414	+1.27583	+7.93	+0.8992
	7	0.7672	1.327	0.016	337 40.9	22 30.7	74 29.5	4 58.0	0.97741	1.27615	7.90	0.8973
	8	0.7700	1.334	0.017	337 35.0	22 30.3	73 25.7	4 53.7	0.98007	1.27649	7.86	0.8954
	9	0.7727	1.340	0.015	337 26.9	22 29.8	72 21.9	4 49.5	0.98201	1.27686	7.82	0.8932
	10	0.7754	1.347	0.011	337 19.7	22 29.3	71 18.2	4 45.2	0.98325	1.27724	7.78	0.8910
	11	0.7782	+1.354	+0.006	337 15.0	22 29.0	70 14.6	4 41.0	+0.98390	+1.27764	+7.74	+0.8886
	12	0.7809	1.360	0.000	337 14.7	22 29.0	69 11.0	4 36.7	0.98412	1.27806	7.69	0.8860
	13	0.7836	1.367	−0.006	337 19.7	22 29.3	68 7.5	4 32.5	0.98412	1.27850	7.64	0.8834
	14	0.7864	1.374	0.011	337 30.4	22 30.0	67 4.0	4 28.3	0.98413	1.27897	7.60	0.8805
	15	0.7891	1.381	0.015	337 46.4	22 31.1	66 0.8	4 24.1	0.98440	1.27944	7.54	0.8775
	16	0.7919	+1.388	−0.016	338 6.6	22 32.4	64 57.7	4 19.8	+0.98520	+1.27993	+7.49	+0.8744
	17	0.7946	1.395	0.014	338 28.8	22 33.9	63 54.6	4 15.6	0.98673	1.28043	7.43	0.8710
	18	0.7973	1.402	0.011	338 50.2	22 35.3	62 51.7	4 11.4	0.98908	1.28095	7.37	0.8676
	19	0.8001	1.409	−0.005	339 7.6	22 36.5	61 48.9	4 7.2	0.99218	1.28149	7.31	0.8640
	20	0.8028	1.416	+0.001	339 18.5	22 37.2	60 46.2	4 3.1	0.99576	1.28204	7.25	0.8602
h (2.0)	21	0.8056	+1.423	+0.006	339 22.2	22 37.5	59 43.6	3 58.9	+0.99941	+1.28260	+7.18	+0.8562
	22	0.8083	1.431	0.009	339 19.0	22 37.3	58 41.1	3 54.8	1.00272	1.28317	7.11	0.8521
	23	0.8110	1.438	0.010	339 12.0	22 36.8	57 38.9	3 50.6	1.00535	1.28376	7.04	0.8478
	24	0.8138	1.446	0.007	339 4.8	22 36.3	56 36.7	3 46.4	1.00711	1.28435	6.97	0.8433
	25	0.8165	1.453	+0.002	339 1.3	22 36.1	55 34.7	3 42.3	1.00804	1.28495	6.90	0.8386
	26	0.8192	+1.461	−0.004	339 5.0	22 36.3	54 32.9	3 38.2	+1.00841	+1.28557	+6.82	+0.8338
	27	0.8220	1.469	0.009	339 17.0	22 37.1	53 31.1	3 34.1	1.00865	1.28619	6.74	0.8288
	28	0.8247	1.477	0.012	339 37.0	22 38.5	52 29.5	3 30.0	1.00925	1.28682	6.66	0.8235
	29	0.8275	1.485	0.012	340 2.0	22 40.1	51 28.1	3 25.9	1.01058	1.28745	6.58	0.8181
	30	0.8302	1.493	0.008	340 28.1	22 41.9	50 26.8	3 21.8	1.01280	1.28809	6.49	0.8125
	31	0.8329	+1.501	−0.002	340 51.4	22 43.4	49 25.7	3 17.7	+1.01583	+1.28874	+6.41	+0.8066
Nov.	1	0.8357	1.509	+0.005	341 8.9	22 44.6	48 24.7	3 13.6	1.01943	1.28939	6.32	0.8006
	2	0.8384	1.518	0.011	341 19.2	22 45.3	47 23.9	3 9.6	1.02317	1.29004	6.23	0.7942
	3	0.8412	1.526	0.015	341 22.9	22 45.5	46 23.2	3 5.5	1.02667	1.29069	6.13	0.7877
	4	0.8439	1.535	0.017	341 21.8	22 45.5	45 22.6	3 1.5	1.02964	1.29135	6.04	0.7810
h (3.0)	5	0.8466	+1.544	+0.016	341 18.2	22 45.2	44 22.2	2 57.5	+1.03197	+1.29200	+5.94	+0.7740
	6	0.8494	1.552	0.013	341 14.8	22 45.0	43 22.0	2 53.5	1.03366	1.29266	5.84	0.7667
	7	0.8521	1.561	0.008	341 13.4	22 44.9	42 21.9	2 49.5	1.03480	1.29331	5.74	0.7592
	8	0.8548	1.570	+0.002	341 15.5	22 45.0	41 21.9	2 45.5	1.03554	1.29397	5.64	0.7514
	9	0.8576	1.579	−0.004	341 22.2	22 45.5	40 22.1	2 41.5	1.03607	1.29462	5.54	0.7433
	10	0.8603	+1.588	−0.009	341 33.7	22 46.2	39 22.4	2 37.5	+1.03661	+1.29527	+5.43	+0.7349
	11	0.8630	1.598	0.013	341 50.0	22 47.3	38 22.9	2 33.5	1.03739	1.29591	5.32	0.7262
	12	0.8658	1.607	0.015	342 9.7	22 48.6	37 23.6	2 29.6	1.03863	1.29655	5.22	0.7172
	13	0.8685	1.616	0.014	342 31.4	22 50.1	36 24.3	2 25.6	1.04051	1.29718	5.10	0.7079
	14	0.8713	1.626	0.011	342 52.4	22 51.5	35 25.2	2 21.7	1.04311	1.29781	4.99	0.6982
	15	0.8740	+1.635	−0.006	343 10.1	22 52.7	34 26.3	2 17.7	+1.04636	+1.29843	+4.88	+0.6882
	16	0.8767	+1.645	0.000	343 22.4	22 53.5	33 27.6	2 13.8	+1.05006	+1.29904	+4.76	+0.6778

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FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)		τ	f	f′	G		H		Log g.	Log h.	i	Log i.
			In Time.	In Time.	In Arc.	In Time.	In Arc.	In Time.				
		y	s	s	° ′	h m	° ′	h m			″	
Nov.	16	0.8767	+1.645	0.000	343 22.4	22 53.5	33 27.6	2 13.8	+1.05006	+1.29904	+4.76	+0.6778
	17	0.8795	1.655	+0.006	343 28.0	22 53.9	32 28.9	2 9.9	1.05390	1.29964	4.64	0.6669
	18	0.8822	1.665	0.009	343 27.2	22 53.8	31 30.4	2 6.0	1.05751	1.30023	4.53	0.6558
	19	0.8850	1.675	0.010	343 22.2	22 53.5	30 32.1	2 2.1	1.06054	1.30082	4.41	0.6440
	20	0.8877	1.685	0.008	343 16.0	22 53.1	29 33.8	1 58.3	1.06280	1.30139	4.28	0.6319
h (4.0)	21	0.8904	+1.695	+0.003	343 12.2	22 52.8	28 35.7	1 54.4	+1.06432	+1.30195	+4.16	+0.6192
	22	0.8932	1.706	−0.003	343 13.8	22 52.9	27 37.8	1 50.5	1.06532	1.30250	4.04	0.6061
	23	0.8959	1.716	0.008	343 22.6	22 53.5	26 39.9	1 46.6	1.06614	1.30304	3.91	0.5924
	24	0.8986	1.727	0.012	343 38.5	22 54.6	25 42.3	1 42.8	1.06721	1.30356	3.78	0.5781
	25	0.9014	1.737	0.013	343 59.4	22 56.0	24 44.6	1 39.0	1.06889	1.30407	3.66	0.5631
	26	0.9041	+1.748	−0.011	344 21.9	22 57.5	23 47.2	1 35.1	+1.07137	+1.30457	+3.53	+0.5475
	27	0.9069	1.758	−0.005	344 42.4	22 58.8	22 49.8	1 31.3	1.07462	1.30505	3.40	0.5312
	28	0.9096	1.769	+0.001	344 57.9	22 59.9	21 52.5	1 27.5	1.07842	1.30552	3.27	0.5140
	29	0.9123	1.780	0.008	345 7.1	23 0.5	20 55.4	1 23.7	1.08243	1.30597	3.13	0.4961
	30	0.9151	1.791	0.014	345 10.1	23 0.7	19 58.3	1 19.9	1.08628	1.30640	3.00	0.4772
Dec.	1	0.9178	+1.802	+0.017	345 8.2	23 0.5	19 1.3	1 16.1	+1.08968	+1.30682	+2.87	+0.4572
	2	0.9206	1.813	0.017	345 3.7	23 0.2	18 4.4	1 12.3	1.09250	1.30722	2.73	0.4362
	3	0.9233	1.824	0.015	344 58.7	22 59.9	17 7.6	1 8.5	1.09472	1.30760	2.59	0.4140
	4	0.9260	1.835	0.010	344 55.2	22 59.7	16 10.9	1 4.7	1.09641	1.30797	2.46	0.3904
	5	0.9288	1.846	+0.004	344 54.5	22 59.6	15 14.2	1 0.9	1.09772	1.30831	2.32	0.3653
h (5.0)	6	0.9315	+1.858	−0.002	344 57.6	22 59.8	14 17.6	0 57.2	+1.09882	+1.30864	+2.18	+0.3384
	7	0.9342	1.869	0.008	345 4.6	23 0.3	13 21.1	0 53.4	1.09990	1.30895	2.04	0.3097
	8	0.9370	1.880	0.012	345 15.5	23 1.0	12 24.6	0 49.6	1.10116	1.30924	1.90	0.2788
	9	0.9397	1.892	0.014	345 29.5	23 2.0	11 28.2	0 45.9	1.10278	1.30951	1.76	0.2454
	10	0.9424	1.903	0.014	345 45.0	23 3.0	10 31.9	0 42.1	1.10491	1.30976	1.62	0.2090
	11	0.9452	+1.915	−0.012	346 0.4	23 4.0	9 35.5	0 38.4	+1.10762	+1.30999	+1.48	+0.1690
	12	0.9479	1.926	0.007	346 13.2	23 4.9	8 39.3	0 34.6	1.11088	1.31020	1.33	0.1250
	13	0.9507	1.938	−0.001	346 21.6	23 5.4	7 43.0	0 30.9	1.11455	1.31038	1.19	0.0757
	14	0.9534	1.949	+0.005	346 24.3	23 5.6	6 46.8	0 27.1	1.11838	1.31055	1.05	0.0200
	15	0.9561	1.961	0.009	346 21.3	23 5.4	5 50.7	0 23.4	1.12206	1.31069	0.90	9.9559
	16	0.9589	+1.973	+0.011	346 14.0	23 4.9	4 54.6	0 19.6	+1.12529	+1.31082	+0.76	+9.8805
	17	0.9616	1.984	0.010	346 4.9	23 4.3	3 58.5	0 15.9	1.12787	1.31092	0.62	9.7890
	18	0.9644	1.996	+0.006	345 56.9	23 3.8	3 2.3	0 12.2	1.12977	1.31100	0.47	9.6727
	19	0.9671	2.008	0.000	345 52.9	23 3.5	2 6.3	0 8.4	1.13112	1.31106	0.33	9.5133
	20	0.9698	2.020	−0.006	345 54.8	23 3.7	1 10.3	0 4.7	1.13220	1.31110	0.18	9.2585
h (6.0)	21	0.9726	+2.031	−0.011	346 2.7	23 4.2	0 14.2	0 0.9	+1.13339	+1.31112	+0.04	+8.5630
	22	0.9753	2.043	0.014	346 15.5	23 5.0	359 18.1	23 57.2	1.13503	1.31111	−0.11	−9.0344
	23	0.9780	2.055	0.013	346 30.5	23 6.0	358 22.0	23 53.5	1.13732	1.31108	0.25	9.4032
	24	0.9808	2.066	0.008	346 44.5	23 7.0	357 25.9	23 49.7	1.14028	1.31104	0.40	9.5996
	25	0.9835	2.078	−0.002	346 54.9	23 7.7	356 29.8	23 46.0	1.14376	1.31097	0.54	9.7343
	26	0.9863	+2.090	+0.005	346 59.9	23 8.0	355 33.7	23 42.2	+1.14751	+1.31087	−0.69	−9.8368
	27	0.9890	2.101	0.011	346 59.4	23 8.0	354 37.6	23 38.5	1.15120	1.31076	0.83	9.9196
	28	0.9917	2.113	0.015	346 54.2	23 7.6	353 41.4	23 34.8	1.15454	1.31063	0.98	9.9890
	29	0.9945	2.125	0.017	346 46.3	23 7.1	352 45.1	23 31.0	1.15738	1.31047	1.12	0.0487
	30	0.9972	2.136	0.015	346 37.4	23 6.5	351 48.8	23 27.3	1.15968	1.31029	1.26	0.1010
	31	1.0000	+2.148	+0.011	346 29.5	23 6.0	350 52.5	23 23.5	+1.16149	+1.31009	−1.40	−0.1476
	32	1.0027	+2.159	+0.006	346 23.8	23 5.6	349 56.1	23 19.7	+1.16290	+1.30987	−1.55	−0.1896

JANUARY, 1909.

(CONSTANTS OF PARIS CONFERENCE.)

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Ursæ Min. (*Polaris*).		Mean Solar Date.	51 Cephei (Hev.).		Mean Solar Date.	6 Ursæ Min. (B.).		Mean Solar Date.	δ Ursæ Min.		Mean Solar Date.	λ Ursæ Min.	
	Right Ascension.	Declination *North*.		Right Ascension.	Declination *North*.		Right Ascension.	Declination *North*.		Right Ascension.	Declination *North*.		Right Ascension.	Declination *North*.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Jan.	1 25	+88 49	Jan.	6 58	+87 11	Jan.	12 14	+88 12	Jan.	18 1	+86 36	Jan.	19 11	+89 0
	s	″		s	″		s	″		s	″		s	″
0.3	92.66	28.8	0.5	27.76	36.7	0.7	30.85	2.0	0.9	21.04	46.7	1.0	13.83	16.1
1.3	91.73	28.9	1.5	27.88	37.0	1.7	31.51	2.0	1.9	21.05	46.4	2.0	13.47	15.8
2.3	90.86	29.0	2.5	28.00	37.3	2.7	32.16	2.0	2.9	21.05	46.1	3.0	13.08	15.5
3.3	89.97	29.1	3.5	28.12	37.6	3.7	32.84	1.9	3.9	21.04	45.8	4.0	12.65	15.2
4.3	89.03	29.3	4.5	28.26	37.9	4.7	33.55	1.9	4.9	21.03	45.4	5.0	12.21	14.9
5.3	88.04	29.4	5.5	28.41	38.2	5.7	34.28	1.8	5.9	21.04	45.1	6.0	11.78	14.6
6.3	86.99	29.6	6.5	28.55	38.6	6.7	35.06	1.8	6.9	21.05	44.7	6.9	11.39	14.2
7.3	85.88	29.7	7.5	28.66	38.9	7.7	35.86	1.8	7.9	21.09	44.3	7.9	11.06	13.9
8.3	84.72	29.8	8.5	28.74	39.3	8.7	36.68	1.8	8.9	21.15	43.9	8.9	10.81	13.5
9.3	83.53	29.8	9.5	28.80	39.7	9.7	37.49	1.8	9.9	21.25	43.5	9.9	10.66	13.1
10.3	82.35	29.9	10.5	28.83	40.0	10.7	38.27	1.9	10.9	21.37	43.2	10.9	10.59	12.7
11.3	81.18	29.9	11.5	28.82	40.4	11.7	39.02	1.9	11.9	21.49	42.8	11.9	10.58	12.4
12.2	80.06	30.0	12.5	28.80	40.7	12.7	39.72	2.0	12.9	21.62	42.5	12.9	10.62	12.0
13.2	79.00	30.0	13.5	28.78	41.0	13.7	40.39	2.1	13.9	21.74	42.2	13.9	10.66	11.7
14.2	77.99	30.0	14.5	28.76	41.3	14.7	41.03	2.2	14.9	21.86	41.9	14.9	10.69	11.4
15.2	77.02	30.0	15.5	28.75	41.6	15.7	41.66	2.2	15.9	21.96	41.6	15.9	10.68	11.1
16.2	76.07	30.0	16.5	28.75	41.9	16.7	42.29	2.3	16.9	22.06	41.3	16.9	10.63	10.8
17.2	75.11	30.1	17.5	28.76	42.2	17.7	42.93	2.3	17.9	22.15	41.0	17.9	10.54	10.5
18.2	74.12	30.1	18.5	28.79	42.5	18.7	43.61	2.3	18.9	22.24	40.7	18.9	10.44	10.2
19.2	73.08	30.2	19.5	28.82	42.8	19.7	44.33	2.4	19.9	22.32	40.4	19.9	10.34	9.8
20.2	71.99	30.2	20.4	28.83	43.2	20.7	45.07	2.5	20.9	22.43	40.0	20.9	10.28	9.5
21.2	70.84	30.2	21.4	28.82	43.5	21.7	45.83	2.6	21.9	22.56	39.6	21.9	10.28	9.1
22.2	69.67	30.3	22.4	28.80	43.9	22.7	46.59	2.7	22.9	22.72	39.3	22.9	10.36	8.7
23.2	68.48	30.3	23.4	28.74	44.3	23.7	47.33	2.8	23.9	22.90	38.9	23.9	10.53	8.4
24.2	67.30	30.2	24.4	28.64	44.6	24.7	48.06	3.0	24.9	23.10	38.6	24.9	10.79	8.0
25.2	66.16	30.2	25.4	28.53	45.0	25.7	48.74	3.1	25.9	23.31	38.3	25.9	11.10	7.7
26.2	65.08	30.1	26.4	28.40	45.3	26.7	49.37	3.3	26.9	23.52	38.0	26.9	11.45	7.3
27.2	64.05	30.0	27.4	28.26	45.6	27.7	49.96	3.5	27.9	23.73	37.8	27.9	11.80	7.0
28.2	63.07	30.0	28.4	28.12	45.9	28.7	50.51	3.6	28.9	23.92	37.5	28.9	12.14	6.7
29.2	62.13	29.9	29.4	28.00	46.1	29.7	51.06	3.8	29.9	24.11	37.3	29.9	12.45	6.5
30.2	61.22	29.8	30.4	27.90	46.4	30.7	51.62	3.9	30.9	24.29	37.0	30.9	12.72	6.2
31.2	60.29	29.8	31.4	27.81	46.7	31.6	52.20	4.0	31.9	24.47	36.7	31.9	12.97	5.9
32.2	59.32	29.8	32.4	27.70	47.0	32.6	52.79	4.1	32.9	24.65	36.5	32.9	13.21	5.6

(CONSTANTS OF PARIS CONFERENCE.)

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	*α* Ursæ Min. (*Polaris*).		Mean Solar Date.	51 Cephei (Hev.).		Mean Solar Date.	6 Ursæ Min. (B.).		Mean Solar Date.	*δ* Ursæ Min.		Mean Solar Date.	*λ* Ursæ Min.	
	Right Ascension.	Declination *North*.		Right Ascension.	Declination *North*.		Right Ascension.	Declination *North*.		Right Ascension.	Declination *North*.		Right Ascension.	Declination *North*.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Feb.	1 25	+88 49	Feb.	6 58	+87 11	Feb.	12 14	+88 12	Feb.	18 1	+86 36	Feb.	19 11	+88 59
	s	″		s	″		s	″		s	″		s	″
1.2	59.32	29.8	1.4	27.70	47.0	1.6	52.79	4.1	1.9	24.65	36.5	1.9	13.21	65.6
2.2	58.31	29.7	2.4	27.60	47.3	2.6	53.43	4.3	2.9	24.84	36.2	2.9	13.48	65.3
3.2	57.23	29.7	3.4	27.47	47.6	3.6	54.10	4.4	3.9	25.05	35.9	3.9	13.81	64.9
4.2	56.12	29.6	4.4	27.32	47.9	4.6	54.77	4.6	4.9	25.29	35.6	4.9	14.21	64.6
5.2	54.98	29.5	5.4	27.15	48.2	5.6	55.43	4.8	5.9	25.55	35.3	5.9	14.69	64.2
6.2	53.84	29.4	6.4	26.95	48.6	6.6	56.07	5.0	6.9	25.84	35.0	6.9	15.26	63.9
7.2	52.74	29.2	7.4	26.72	48.9	7.6	56.67	5.2	7.9	26.14	34.7	7.9	15.91	63.6
8.2	51.67	29.1	8.4	26.47	49.2	8.6	57.22	5.5	8.9	26.44	34.5	8.9	16.60	63.3
9.2	50.65	28.9	9.4	26.20	49.5	9.6	57.74	5.7	9.9	26.75	34.3	9.9	17.31	63.0
10.2	49.71	28.8	10.4	25.94	49.7	10.6	58.22	5.9	10.9	27.05	34.1	10.9	18.01	62.7
11.2	48.83	28.6	11.4	25.70	50.0	11.6	58.66	6.1	11.9	27.32	33.9	11.9	18.68	62.4
12.2	48.00	28.5	12.4	25.46	50.2	12.6	59.09	6.3	12.9	27.58	33.7	12.9	19.30	62.2
13.2	47.19	28.3	13.4	25.23	50.4	13.6	59.52	6.5	13.8	27.83	33.5	13.9	19.87	61.9
14.2	46.36	28.2	14.4	25.03	50.7	14.6	59.98	6.7	14.8	28.07	33.3	14.9	20.40	61.7
15.2	45.49	28.1	15.4	24.83	50.9	15.6	60.46	6.9	15.8	28.32	33.1	15.9	20.93	61.4
16.2	44.59	27.9	16.4	24.63	51.2	16.6	60.97	7.1	16.8	28.57	32.8	16.9	21.49	61.1
17.2	43.64	27.8	17.4	24.41	51.5	17.6	61.50	7.3	17.8	28.85	32.6	17.9	22.09	60.8
18.2	42.65	27.7	18.4	24.16	51.7	18.6	62.04	7.6	18.8	29.14	32.3	18.9	22.77	60.6
19.1	41.65	27.5	19.4	23.89	52.0	19.6	62.57	7.9	19.8	29.46	32.1	19.9	23.52	60.3
20.1	40.68	27.3	20.4	23.60	52.3	20.6	63.07	8.2	20.8	29.80	31.9	20.9	24.35	60.0
21.1	39.74	27.1	21.4	23.29	52.6	21.6	63.52	8.5	21.8	30.14	31.7	21.9	25.24	59.7
22.1	38.86	26.9	22.4	22.95	52.8	22.6	63.91	8.8	22.8	30.49	31.5	22.9	26.17	59.4
23.1	38.04	26.6	23.4	22.60	53.0	23.6	64.26	9.1	23.8	30.84	31.4	23.9	27.11	59.2
24.1	37.30	26.4	24.4	22.26	53.2	24.6	64.57	9.4	24.8	31.17	31.3	24.9	28.04	59.0
25.1	36.61	26.2	25.4	21.93	53.4	25.6	64.85	9.6	25.8	31.50	31.2	25.9	28.94	58.8
26.1	35.96	26.0	26.4	21.61	53.6	26.6	65.12	9.9	26.8	31.81	31.0	26.9	29.79	58.6
27.1	35.31	25.8	27.4	21.31	53.8	27.6	65.41	10.2	27.8	32.10	30.9	27.9	30.60	58.4
28.1	34.63	25.6	28.4	21.02	53.9	28.6	65.72	10.4	28.8	32.39	30.8	28.9	31.39	58.2
29.1	33.93	25.4	29.3	20.72	54.1	29.6	66.07	10.6	29.8	32.69	30.6	29.9	32.19	58.0
30.1	33.18	25.2	30.3	20.43	54.3	30.6	66.43	10.9	30.8	33.01	30.5	30.9	33.03	57.8

(CONSTANTS OF PARIS CONFERENCE.)

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Ursæ Min. (*Polaris*).		Mean Solar Date.	51 Cephei (Hev.).		Mean Solar Date.	6 Ursæ Min. (B.).		Mean Solar Date.	δ Ursæ Min.		Mean Solar Date.	λ Ursæ Min.	
	Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Mar.	1 25	+88 49	Mar.	6 58	+87 11	Mar.	12 15	+88 12	Mar.	18 1	+86 36	Mar.	19 11	+88 59
	s	″		s	″		s	″		s	″		s	″
1.1	33.93	25.4	1.3	20.72	54.1	1.6	6.07	10.6	1.8	32.69	30.6	1.9	32.19	58.0
2.1	33.18	25.2	2.3	20.43	54.3	2.6	6.43	10.9	2.8	33.01	30.5	2.9	33.03	57.8
3.1	32.40	25.0	3.3	20.11	54.6	3.6	6.80	11.2	3.8	33.34	30.3	3.8	33.92	57.6
4.1	31.59	24.8	4.3	19.77	54.8	4.6	7.16	11.4	4.8	33.70	30.2	4.8	34.88	57.3
5.1	30.78	24.5	5.3	19.40	55.0	5.6	7.51	11.7	5.8	34.08	30.0	5.8	35.93	57.1
6.1	29.99	24.3	6.3	19.00	55.2	6.6	7.83	12.1	6.8	34.46	29.9	6.8	37.05	56.9
7.1	29.26	24.0	7.3	18.57	55.4	7.6	8.10	12.4	7.8	34.86	29.8	7.8	38.21	56.7
8.1	28.60	23.7	8.3	18.14	55.5	8.6	8.31	12.7	8.8	35.26	29.7	8.8	39.39	56.5
9.1	28.01	23.4	9.3	17.72	55.7	9.5	8.47	13.1	9.8	35.64	29.7	9.8	40.57	56.3
10.1	27.49	23.1	10.3	17.30	55.8	10.5	8.60	13.4	10.8	36.01	29.6	10.8	41.71	56.2
11.1	27.02	22.8	11.3	16.91	55.9	11.5	8.71	13.7	11.8	36.37	29.6	11.8	42.80	56.1
12.1	26.58	22.5	12.3	16.53	56.0	12.5	8.81	14.0	12.8	36.71	29.6	12.8	43.84	56.0
13.1	26.15	22.3	13.3	16.17	56.1	13.5	8.93	14.2	13.8	37.03	29.5	13.8	44.82	55.9
14.1	25.71	22.0	14.3	15.83	56.2	14.5	9.07	14.5	14.8	37.35	29.5	14.8	45.77	55.7
15.1	25.24	21.8	15.3	15.50	56.3	15.5	9.24	14.8	15.8	37.67	29.4	15.8	46.72	55.6
16.1	24.73	21.5	16.3	15.15	56.5	16.5	9.43	15.1	16.8	38.00	29.4	16.8	47.70	55.4
17.1	24.19	21.3	17.3	14.78	56.6	17.5	9.62	15.4	17.8	38.36	29.3	17.8	48.72	55.3
18.1	23.64	21.0	18.3	14.39	56.8	18.5	9.80	15.7	18.8	38.72	29.2	18.8	49.80	55.1
19.1	23.08	20.7	19.3	13.98	56.9	19.5	9.96	16.0	19.8	39.10	29.2	19.8	50.97	55.0
20.1	22.57	20.4	20.3	13.55	57.0	20.5	10.08	16.4	20.8	39.50	29.2	20.8	52.20	54.9
21.1	22.12	20.1	21.3	13.11	57.1	21.5	10.15	16.8	21.7	39.89	29.2	21.8	53.46	54.8
22.1	21.73	19.8	22.3	12.66	57.2	22.5	10.17	17.1	22.7	40.27	29.2	22.8	54.73	54.7
23.1	21.43	19.5	23.3	12.21	57.2	23.5	10.15	17.5	23.7	40.65	29.2	23.8	55.98	54.6
24.1	21.19	19.2	24.3	11.78	57.3	24.5	10.08	17.8	24.7	41.01	29.3	24.8	57.20	54.5
25.0	21.01	18.9	25.3	11.37	57.3	25.5	10.01	18.1	25.7	41.35	29.3	25.8	58.35	54.5
26.0	20.84	18.6	26.3	10.98	57.3	26.5	9.93	18.4	26.7	41.68	29.4	26.8	59.45	54.5
27.0	20.67	18.3	27.3	10.59	57.3	27.5	9.87	18.6	27.7	42.00	29.4	27.8	60.51	54.4
28.0	20.48	18.0	28.3	10.21	57.4	28.5	9.84	18.9	28.7	42.31	29.5	28.8	61.55	54.4
29.0	20.26	17.8	29.3	9.85	57.4	29.5	9.82	19.2	29.7	42.63	29.5	29.8	62.61	54.3
30.0	19.99	17.5	30.3	9.47	57.5	30.5	9.83	19.5	30.7	42.96	29.5	30.8	63.70	54.3
31.0	19.69	17.2	31.3	9.07	57.5	31.5	9.84	19.8	31.7	43.32	29.5	31.8	64.85	54.2
32.0	19.38	16.9	32.3	8.65	57.6	32.5	9.85	20.1	32.7	43.69	29.5	32.8	66.07	54.1

(CONSTANTS OF PARIS CONFERENCE.)

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Ursæ Min. (*Polaris*).		Mean Solar Date.	51 Cephei (Hev.)		Mean Solar Date.	6 Ursæ Min. (B.).		Mean Solar Date.	δ Ursæ Min.		Mean Solar Date.	λ Ursæ Min.	
	Right Ascension.	Declination *North*.		Right Ascension.	Declination *North*.		Right Ascension.	Declination *North*.		Right Ascension.	Declination *North*.		Right Ascension.	Declination *North*.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Apr.	1 25	+88 49	Apr.	6 57	+87 11	Apr.	12 15	+88 12	Apr.	18 1	+86 36	Apr.	19 12	+88 59
	s	″		s	″		s	″		s	″		s	″
1.0	19.38	16.9	1.3	68.65	57.6	1.5	9.85	20.1	1.7	43.69	29.5	1.8	6.07	54.1
2.0	19.10	16.6	2.3	68.21	57.6	2.5	9.82	20.4	2.7	44.08	29.6	2.8	7.35	54.1
3.0	18.86	16.2	3.3	67.75	57.7	3.5	9.75	20.8	3.7	44.47	29.6	3.8	8.66	54.0
4.0	18.69	15.9	4.3	67.28	57.7	4.5	9.62	21.1	4.7	44.85	29.7	4.8	10.00	54.0
5.0	18.60	15.6	5.3	66.81	57.7	5.5	9.44	21.4	5.7	45.23	29.9	5.8	11.34	54.0
6.0	18.57	15.2	6.3	66.35	57.6	6.5	9.22	21.7	6.7	45.59	30.0	6.8	12.64	54.0
7.0	18.60	14.9	7.2	65.92	57.6	7.5	8.97	22.0	7.7	45.94	30.1	7.8	13.88	54.1
8.0	18.69	14.6	8.2	65.51	57.5	8.5	8.72	22.3	8.7	46.26	30.3	8.8	15.05	54.1
9.0	18.80	14.3	9.2	65.12	57.4	9.5	8.48	22.6	9.7	46.56	30.4	9.7	16.16	54.2
10.0	18.90	14.0	10.2	64.74	57.4	10.5	8.26	22.8	10.7	46.85	30.5	10.7	17.20	54.2
11.0	18.99	13.7	11.2	64.38	57.3	11.5	8.05	23.1	11.7	47.13	30.6	11.7	18.22	54.3
12.0	19.03	13.4	12.2	64.03	57.3	12.5	7.88	23.4	12.7	47.41	30.7	12.7	19.26	54.3
12.9	19.04	13.2	13.2	63.67	57.3	13.5	7.73	23.6	13.7	47.71	30.8	13.7	20.31	54.3
13.9	19.02	12.9	14.2	63.30	57.2	14.5	7.57	23.9	14.7	48.02	30.9	14.7	21.41	54.3
14.9	18.99	12.6	15.2	62.91	57.2	15.4	7.39	24.2	15.7	48.36	31.0	15.7	22.57	54.3
15.9	19.00	12.3	16.2	62.49	57.2	16.4	7.18	24.5	16.7	48.69	31.2	16.7	23.79	54.3
16.9	19.07	12.0	17.2	62.06	57.1	17.4	6.93	24.9	17.7	49.02	31.3	17.7	25.04	54.4
17.9	19.20	11.6	18.2	61.63	57.0	18.4	6.62	25.2	18.7	49.36	31.5	18.7	26.29	54.4
18.9	19.41	11.3	19.2	61.21	56.9	19.4	6.27	25.5	19.7	49.68	31.7	19.7	27.52	54.5
19.9	19.69	11.0	20.2	60.79	56.8	20.4	5.88	25.8	20.7	49.99	31.9	20.7	28.70	54.6
20.9	20.02	10.7	21.2	60.39	56.7	21.4	5.47	26.0	21.7	50.27	32.1	21.7	29.83	54.8
21.9	20.39	10.4	22.2	60.02	56.5	22.4	5.06	26.3	22.7	50.53	32.3	22.7	30.90	54.9
22.9	20.77	10.1	23.2	59.68	56.4	23.4	4.67	26.5	23.7	50.77	32.5	23.7	31.90	55.0
23.9	21.13	9.8	24.2	59.35	56.3	24.4	4.30	26.7	24.7	51.01	32.7	24.7	32.86	55.1
24.9	21.46	9.6	25.2	59.03	56.1	25.4	3.95	26.9	25.7	51.26	32.9	25.7	33.81	55.3
25.9	21.74	9.3	26.2	58.70	56.0	26.4	3.63	27.2	26.7	51.51	33.1	26.7	34.78	55.4
26.9	21.98	9.1	27.2	58.36	55.9	27.4	3.32	27.4	27.7	51.77	33.2	27.7	35.78	55.4
27.9	22.21	8.8	28.2	58.01	55.8	28.4	3.00	27.6	28.7	52.04	33.4	28.7	36.83	55.5
28.9	22.45	8.5	29.2	57.64	55.7	29.4	2.67	27.9	29.6	52.32	33.6	29.7	37.94	55.6
29.9	22.72	8.2	30.2	57.25	55.6	30.4	2.31	28.1	30.6	52.61	33.8	30.7	39.09	55.7
30.9	23.05	7.9	31.2	56.85	55.5	31.4	1.91	28.4	31.6	52.90	34.0	31.7	40.27	55.9
31.9	23.44	7.6	32.2	56.46	55.3	32.4	1.45	28.6	32.6	53.18	34.3	32.7	41.44	56.0

(CONSTANTS OF PARIS CONFERENCE.)

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Ursæ Min. (*Polaris*).		Mean Solar Date.	51 Cephei (Hev.).		Mean Solar Date.	6 Ursæ Min. (B.).		Mean Solar Date.	δ Ursæ Min.		Mean Solar Date.	λ Ursæ Min.	
	Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
May	1 25	+88 49	May	6 57	+87 11	May	12 14	+88 12	May	18 1	+86 36	May	19 12	+88 59
	s	″		s	″		s	″		s	″		s	″
1.9	23.44	7.6	1.2	56.85	55.5	1.4	61.91	28.4	1.6	52.90	34.0	1.7	40.27	55.9
2.9	23.91	7.3	2.2	56.46	55.3	2.4	61.45	28.6	2.6	53.18	34.3	2.7	41.44	56.0
3.9	24.45	7.0	3.2	56.08	55.1	3.4	60.95	28.9	3.6	53.44	34.5	3.7	42.58	56.2
4.9	25.03	6.7	4.2	55.72	54.9	4.4	60.42	29.1	4.6	53.69	34.8	4.7	43.64	56.4
5.9	25.65	6.5	5.2	55.38	54.7	5.4	59.88	29.3	5.6	53.91	35.1	5.7	44.63	56.6
6.9	26.27	6.2	6.2	55.07	54.5	6.4	59.34	29.5	6.6	54.10	35.3	6.7	45.54	56.8
7.9	26.86	6.0	7.2	54.79	54.3	7.4	58.82	29.6	7.6	54.28	35.6	7.7	46.37	57.0
8.9	27.42	5.8	8.2	54.52	54.1	8.4	58.34	29.8	8.6	54.45	35.8	8.7	47.16	57.2
9.9	27.94	5.6	9.2	54.27	53.9	9.4	57.88	30.0	9.6	54.61	36.1	9.7	47.93	57.3
10.9	28.42	5.4	10.2	54.03	53.8	10.4	57.43	30.1	10.6	54.78	36.3	10.7	48.72	57.5
11.9	28.89	5.2	11.2	53.77	53.6	11.4	57.00	30.3	11.6	54.97	36.5	11.7	49.54	57.7
12.9	29.37	4.9	12.2	53.50	53.4	12.4	56.57	30.5	12.6	55.17	36.7	12.7	50.40	57.8
13.9	29.89	4.7	13.1	53.21	53.3	13.4	56.12	30.7	13.6	55.37	37.0	13.7	51.31	58.0
14.9	30.47	4.4	14.1	52.91	53.1	14.4	55.64	30.9	14.6	55.58	37.2	14.7	52.24	58.2
15.9	31.13	4.2	15.1	52.60	52.9	15.4	55.11	31.1	15.6	55.78	37.5	15.7	53.19	58.4
16.9	31.85	3.9	16.1	52.29	52.6	16.4	54.53	31.3	16.6	55.96	37.8	16.7	54.12	58.6
17.9	32.63	3.7	17.1	52.01	52.4	17.4	53.92	31.5	17.6	56.13	38.1	17.6	55.00	58.9
18.9	33.45	3.5	18.1	51.75	52.1	18.4	53.29	31.6	18.6	56.28	38.4	18.6	55.82	59.1
19.9	34.28	3.3	19.1	51.50	51.9	19.4	52.65	31.8	19.6	56.40	38.7	19.6	56.56	59.4
20.9	35.08	3.1	20.1	51.28	51.6	20.4	52.03	31.9	20.6	56.51	39.0	20.6	57.22	59.6
21.9	35.86	2.9	21.1	51.10	51.3	21.3	51.43	32.0	21.6	56.60	39.3	21.6	57.83	59.9
22.9	36.60	2.8	22.1	50.93	51.1	22.3	50.86	32.1	22.6	56.69	39.6	22.6	58.41	60.2
23.9	37.29	2.6	23.1	50.76	50.9	23.3	50.33	32.1	23.6	56.78	39.9	23.6	58.98	60.4
24.9	37.95	2.5	24.1	50.58	50.6	24.3	49.81	32.2	24.6	56.88	40.1	24.6	59.57	60.6
25.9	38.59	2.3	25.1	50.39	50.4	25.3	49.30	32.3	25.6	56.99	40.4	25.6	60.21	60.8
26.9	39.26	2.1	26.1	50.19	50.2	26.3	48.78	32.4	26.6	57.13	40.6	26.6	60.90	61.0
27.9	39.96	1.9	27.1	49.97	50.0	27.3	48.24	32.6	27.6	57.28	40.9	27.6	61.63	61.2
28.9	40.72	1.7	28.1	49.74	49.8	28.3	47.66	32.7	28.6	57.41	41.2	28.6	62.37	61.5
29.9	41.56	1.5	29.1	49.50	49.5	29.3	47.04	32.8	29.6	57.54	41.5	29.6	63.12	61.7
30.9	42.46	1.3	30.1	49.28	49.2	30.3	46.39	32.9	30.6	57.65	41.8	30.6	63.83	62.0
31.9	43.41	1.1	31.1	49.08	48.9	31.3	45.70	33.0	31.6	57.74	42.2	31.6	64.49	62.3
32.9	44.39	1.0	32.1	48.90	48.6	32.3	45.00	33.1	32.6	57.80	42.5	32.6	65.06	62.6

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Ursæ Min. (*Polaris*).		Mean Solar Date.	51 Cephei (Hev.).		Mean Solar Date.	6 Ursæ Min. (B.).		Mean Solar Date.	δ Ursæ Min.		Mean Solar Date.	λ Ursæ Min.	
	Right Ascension.	Declination *North*.		Right Ascension.	Declination *North*.		Right Ascension.	Declination *North*.		Right Ascension.	Declination *North*.		Right Ascension.	Declination *North*.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
June	1 25	+88 48	June	6 57	+87 11	June	12 14	+88 12	June	18 1	+86 36	June	19 13	+89 0
	s	″		s	″		s	″		s	″		s	″
1.9	44.39	61.0	1.1	48.90	48.6	1.3	45.00	33.1	1.6	57.80	42.5	1.6	5.06	2.6
2.9	45.37	60.8	2.1	48.75	48.3	2.3	44.30	33.1	2.6	57.84	42.9	2.6	5.55	2.9
3.9	46.33	60.7	3.1	48.63	48.0	3.3	43.62	33.1	3.6	57.86	43.2	3.6	5.96	3.2
4.9	47.26	60.6	4.1	48.54	47.7	4.3	42.97	33.1	4.6	57.87	43.5	4.6	6.30	3.5
5.9	48.14	60.5	5.1	48.48	47.4	5.3	42.36	33.2	5.5	57.87	43.8	5.6	6.61	3.8
6.9	48.97	60.4	6.1	48.41	47.2	6.3	41.78	33.2	6.5	57.87	44.1	6.6	6.91	4.1
7.8	49.77	60.3	7.1	48.34	46.9	7.3	41.22	33.2	7.5	57.88	44.4	7.6	7.23	4.3
8.8	50.57	60.2	8.1	48.26	46.7	8.3	40.66	33.2	8.5	57.90	44.6	8.6	7.57	4.6
9.8	51.39	60.1	9.1	48.16	46.4	9.3	40.09	33.3	9.5	57.92	44.9	9.6	7.96	4.8
10.8	52.26	60.0	10.1	48.04	46.2	10.3	39.51	33.3	10.5	57.95	45.2	10.6	8.39	5.1
11.8	53.18	59.9	11.1	47.93	45.9	11.3	38.89	33.4	11.5	57.99	45.5	11.6	8.83	5.4
12.8	54.17	59.8	12.1	47.82	45.6	12.3	38.23	33.4	12.5	58.01	45.8	12.6	9.26	5.7
13.8	55.22	59.7	13.1	47.72	45.3	13.3	37.53	33.5	13.5	58.01	46.2	13.6	9.64	6.0
14.8	56.31	59.6	14.1	47.63	45.0	14.3	36.80	33.5	14.5	58.00	46.6	14.6	9.96	6.3
15.8	57.42	59.5	15.1	47.57	44.6	15.3	36.08	33.5	15.5	57.95	46.9	15.6	10.22	6.7
16.8	58.51	59.4	16.1	47.54	44.3	16.3	35.37	33.4	16.5	57.89	47.2	16.6	10.39	7.0
17.8	59.56	59.4	17.0	47.55	44.0	17.3	34.68	33.4	17.5	57.82	47.6	17.6	10.48	7.4
18.8	60.57	59.4	18.0	47.57	43.6	18.3	34.01	33.3	18.5	57.74	47.9	18.6	10.52	7.7
19.8	61.52	59.4	19.0	47.59	43.3	19.3	33.39	33.2	19.5	57.65	48.2	19.6	10.55	8.0
20.8	62.42	59.3	20.0	47.62	43.1	20.3	32.81	33.2	20.5	57.58	48.4	20.6	10.59	8.3
21.8	63.31	59.3	21.0	47.64	42.8	21.3	32.24	33.1	21.5	57.51	48.7	21.6	10.65	8.6
22.8	64.19	59.3	22.0	47.64	42.5	22.3	31.67	33.1	22.5	57.45	49.0	22.6	10.77	8.8
23.8	65.10	59.2	23.0	47.62	42.3	23.3	31.09	33.1	23.5	57.40	49.3	23.5	10.93	9.1
24.8	66.05	59.2	24.0	47.60	42.0	24.3	30.49	33.0	24.5	57.37	49.6	24.5	11.12	9.4
25.8	67.06	59.1	25.0	47.57	41.7	25.3	29.85	33.0	25.5	57.33	49.9	25.5	11.32	9.7
26.8	68.13	59.0	26.0	47.54	41.4	26.3	29.18	32.9	26.5	57.27	50.2	26.5	11.49	10.0
27.8	69.24	59.0	27.0	47.53	41.0	27.2	28.48	32.9	27.5	57.19	50.6	27.5	11.61	10.4
28.8	70.39	59.0	28.0	47.55	40.7	28.2	27.76	32.8	28.5	57.09	50.9	28.5	11.65	10.7
29.8	71.55	59.0	29.0	47.60	40.3	29.2	27.04	32.7	29.5	56.97	51.3	29.5	11.61	11.1
30.8	72.69	59.0	30.0	47.68	40.0	30.2	26.34	32.6	30.5	56.82	51.6	30.5	11.47	11.4
31.8	73.79	59.0	31.0	47.78	39.7	31.2	25.68	32.4	31.5	56.65	51.9	31.5	11.27	11.8

(CONSTANTS OF PARIS CONFERENCE.)

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	*α* Ursæ Min. (*Polaris*).		Mean Solar Date.	51 Cephei (Hev.).		Mean Solar Date.	6 Ursæ Min. (B.).		Mean Solar Date.	*δ* Ursæ Min.		Mean Solar Date.	*λ* Ursæ Min.	
	Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
July	1 26	+88 48	July	6 57	+87 11	July	12 14	+88 12	July	18 1	+86 36	July	19 12	+89 0
	s	″		s	″		s	″		s	″		s	″
1.8	13.79	59.0	1.0	47.78	39.7	1.2	25.68	32.4	1.5	56.65	51.9	1.5	71.27	11.8
2.8	14.84	59.1	2.0	47.91	39.4	2.2	25.05	32.3	2.5	56.48	52.2	2.5	71.02	12.1
3.8	15.82	59.2	3.0	48.05	39.1	3.2	24.46	32.1	3.5	56.31	52.5	3.5	70.75	12.4
4.8	16.77	59.2	4.0	48.18	38.8	4.2	23.90	32.0	4.5	56.14	52.7	4.5	70.48	12.7
5.8	17.69	59.3	5.0	48.30	38.5	5.2	23.36	31.9	5.5	55.98	53.0	5.5	70.24	12.9
6.8	18.63	59.3	5.9	48.42	38.2	6.2	22.81	31.8	6.5	55.83	53.2	6.5	70.03	13.2
7.8	19.60	59.3	6.9	48.53	38.0	7.2	22.26	31.7	7.5	55.69	53.5	7.5	69.87	13.5
8.8	20.61	59.4	7.9	48.63	37.7	8.2	21.68	31.6	8.5	55.55	53.8	8.5	69.74	13.8
9.8	21.67	59.4	8.9	48.72	37.4	9.2	21.06	31.5	9.5	55.40	54.1	9.5	69.60	14.2
10.8	22.79	59.4	9.9	48.82	37.0	10.2	20.41	31.3	10.5	55.25	54.4	10.5	69.42	14.5
11.8	23.95	59.5	10.9	48.94	36.7	11.2	19.74	31.2	11.5	55.08	54.7	11.5	69.19	14.9
12.8	25.13	59.5	11.9	49.08	36.4	12.2	19.06	31.0	12.4	54.88	55.0	12.5	68.88	15.2
13.8	26.31	59.6	12.9	49.24	36.0	13.2	18.39	30.9	13.4	54.65	55.4	13.5	68.50	15.6
14.8	27.45	59.7	13.9	49.44	35.7	14.2	17.73	30.7	14.4	54.40	55.7	14.5	68.04	15.9
15.7	28.54	59.9	14.9	49.67	35.4	15.2	17.12	30.5	15.4	54.14	56.0	15.5	67.52	16.3
16.7	29.56	60.0	15.9	49.90	35.1	16.2	16.56	30.3	16.4	53.89	56.2	16.5	66.98	16.6
17.7	30.53	60.1	16.9	50.13	34.8	17.2	16.03	30.0	17.4	53.65	56.5	17.5	66.43	16.9
18.7	31.46	60.2	17.9	50.36	34.5	18.2	15.53	29.8	18.4	53.42	56.7	18.5	65.90	17.2
19.7	32.37	60.3	18.9	50.58	34.2	19.2	15.04	29.6	19.4	53.20	56.9	19.5	65.42	17.5
20.7	33.28	60.4	19.9	50.78	34.0	20.2	14.56	29.4	20.4	52.99	57.1	20.5	64.99	17.7
21.7	34.22	60.5	20.9	50.97	33.7	21.2	14.06	29.3	21.4	52.78	57.4	21.5	64.59	18.0
22.7	35.22	60.6	21.9	51.14	33.4	22.2	13.53	29.1	22.4	52.58	57.6	22.5	64.21	18.3
23.7	36.26	60.7	22.9	51.32	33.1	23.2	12.97	28.9	23.4	52.37	57.9	23.5	63.83	18.6
24.7	37.35	60.8	23.9	51.51	32.8	24.2	12.37	28.7	24.4	52.15	58.2	24.5	63.41	18.9
25.7	38.48	60.9	24.9	51.71	32.5	25.2	11.75	28.5	25.4	51.91	58.4	25.5	62.92	19.3
26.7	39.62	61.1	25.9	51.94	32.2	26.2	11.13	28.3	26.4	51.64	58.7	26.5	62.34	19.6
27.7	40.75	61.2	26.9	52.21	31.9	27.2	10.53	28.0	27.4	51.35	59.0	27.5	61.68	20.0
28.7	41.84	61.4	27.9	52.50	31.6	28.2	9.97	27.7	28.4	51.04	59.3	28.5	60.95	20.3
29.7	42.87	61.6	28.9	52.81	31.3	29.2	9.44	27.5	29.4	50.71	59.5	29.5	60.16	20.6
30.7	43.83	61.8	29.9	53.14	31.0	30.2	8.97	27.2	30.4	50.38	59.7	30.5	59.33	20.9
31.7	44.75	62.0	30.9	53.47	30.7	31.2	8.53	26.9	31.4	50.06	59.9	31.4	58.50	21.2
32.7	45.63	62.2	31.9	53.79	30.5	32.1	8.12	26.6	32.4	49.76	60.1	32.4	57.70	21.5

(CONSTANTS OF PARIS CONFERENCE.)

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Ursæ Min. (*Polaris*).		Mean Solar Date.	51 Cephei (Hev.).		Mean Solar Date.	6 Ursæ Min. (B.).		Mean Solar Date.	δ Ursæ Min.		Mean Solar Date.	λ Ursæ Min.	
	Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Aug.	1 26	+88 49	Aug.	6 57	+87 11	Aug.	12 13	+88 12	Aug.	18 1	+86 37	Aug.	19 12	+89 0
	s	″		s	″		s	″		s	″		s	″
1.7	45.63	2.2	1.9	54.10	30.3	1.1	68.12	26.6	1.4	49.76	0.1	1.4	57.70	21.5
2.7	46.49	2.4	2.9	54.40	30.0	2.1	67.71	26.4	2.4	49.47	0.3	2.4	56.92	21.7
3.7	47.37	2.6	3.9	54.69	29.8	3.1	67.30	26.1	3.4	49.18	0.5	3.4	56.20	22.0
4.7	48.28	2.8	4.9	54.97	29.5	4.1	66.87	25.9	4.4	48.90	0.7	4.4	55.51	22.2
5.7	49.23	2.9	5.9	55.25	29.3	5.1	66.40	25.7	5.4	48.62	0.9	5.4	54.83	22.5
6.7	50.24	3.1	6.9	55.54	29.0	6.1	65.91	25.5	6.4	48.33	1.1	6.4	54.13	22.8
7.7	51.29	3.3	7.9	55.85	28.7	7.1	65.40	25.2	7.4	48.02	1.4	7.4	53.39	23.1
8.7	52.36	3.5	8.9	56.19	28.4	8.1	64.87	25.0	8.4	47.70	1.6	8.4	52.58	23.4
9.7	53.43	3.7	9.9	56.55	28.1	9.1	64.35	24.7	9.4	47.35	1.9	9.4	51.70	23.7
10.7	54.47	3.9	10.9	56.93	27.8	10.1	63.85	24.4	10.4	46.99	2.1	10.4	50.75	24.0
11.7	55.46	4.2	11.9	57.34	27.6	11.1	63.39	24.0	11.4	46.61	2.3	11.4	49.72	24.3
12.7	56.39	4.4	12.9	57.76	27.3	12.1	62.96	23.7	12.4	46.23	2.5	12.4	48.65	24.6
13.7	57.24	4.7	13.9	58.16	27.1	13.1	62.58	23.4	13.4	45.84	2.6	13.4	47.59	24.9
14.7	58.04	5.0	14.9	58.55	26.9	14.1	62.25	23.0	14.4	45.47	2.8	14.4	46.55	25.1
15.7	58.80	5.2	15.9	58.93	26.7	15.1	61.94	22.7	15.4	45.12	2.9	15.4	45.55	25.3
16.7	59.56	5.4	16.9	59.29	26.5	16.1	61.64	22.4	16.4	44.79	3.0	16.4	44.59	25.5
17.7	60.34	5.7	17.9	59.63	26.3	17.1	61.33	22.1	17.3	44.47	3.2	17.4	43.68	25.8
18.7	61.15	5.9	18.9	59.97	26.1	18.1	61.00	21.8	18.3	44.15	3.3	18.4	42.79	26.0
19.6	62.00	6.1	19.9	60.31	25.9	19.1	60.63	21.5	19.3	43.82	3.5	19.4	41.91	26.2
20.6	62.90	6.3	20.9	60.67	25.6	20.1	60.24	21.2	20.3	43.49	3.7	20.4	41.01	26.5
21.6	63.83	6.5	21.9	61.05	25.4	21.1	59.83	20.9	21.3	43.14	3.9	21.4	40.07	26.8
22.6	64.79	6.8	22.9	61.46	25.1	22.1	59.41	20.6	22.3	42.77	4.0	22.4	39.07	27.0
23.6	65.74	7.1	23.9	61.89	24.9	23.1	59.00	20.3	23.3	42.38	4.2	23.4	37.97	27.3
24.6	66.64	7.4	24.9	62.34	24.6	24.1	58.61	19.9	24.3	41.97	4.4	24.4	36.80	27.6
25.6	67.49	7.7	25.9	62.82	24.4	25.1	58.27	19.5	25.3	41.54	4.5	25.4	35.57	27.8
26.6	68.27	8.0	26.9	63.31	24.2	26.1	57.98	19.1	26.3	41.10	4.6	26.4	34.29	28.1
27.6	69.00	8.3	27.9	63.78	24.1	27.1	57.74	18.8	27.3	40.68	4.7	27.4	33.00	28.3
28.6	69.66	8.7	28.9	64.24	23.9	28.1	57.54	18.4	28.3	40.26	4.8	28.4	31.74	28.5
29.6	70.29	9.0	29.9	64.69	23.8	29.1	57.35	18.1	29.3	39.86	4.9	29.4	30.52	28.7
30.6	70.93	9.3	30.8	65.12	23.6	30.1	57.16	17.7	30.3	39.48	5.0	30.4	29.34	28.8
31.6	71.59	9.5	31.8	65.54	23.4	31.1	56.97	17.4	31.3	39.10	5.1	31.4	28.21	29.0
32.6	72.30	9.8	32.8	65.96	23.2	32.1	56.75	17.1	32.3	38.73	5.2	32.4	27.10	29.2

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Ursæ Min. (*Polaris*).		Mean Solar Date.	51 Cephei (Hev.).		Mean Solar Date.	6 Ursæ Min. (B.).		Mean Solar Date.	δ Ursæ Min.		Mean Solar Date.	λ Ursæ Min.	
	Right Ascension.	Declination *North*.		Right Ascension.	Declination *North*.		Right Ascension.	Declination *North*.		Right Ascension.	Declination *North*.		Right Ascension.	Declination *North*.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Sept.	1 27	+88 49	Sept.	6 58	+87 11	Sept.	12 13	+88 12	Sept.	18 1	+86 37	Sept.	19 11	+89 0
	s	″		s	″		s	″		s	″		s	″
1.6	12.30	9.8	1.8	5.96	23.2	1.1	56.75	17.1	1.3	38.73	5.2	1.4	87.10	29.2
2.6	13.05	10.1	2.8	6.38	23.1	2.1	56.49	16.8	2.3	38.36	5.3	2.4	86.00	29.4
3.6	13.84	10.4	3.8	6.82	22.9	3.1	56.21	16.4	3.3	37.97	5.4	3.4	84.86	29.6
4.6	14.65	10.7	4.8	7.28	22.7	4.1	55.91	16.1	4.3	37.56	5.5	4.4	83.66	29.8
5.6	15.46	11.0	5.8	7.76	22.5	5.0	55.62	15.8	5.3	37.14	5.6	5.3	82.41	30.0
6.6	16.26	11.3	6.8	8.26	22.3	6.0	55.34	15.4	6.3	36.69	5.7	6.3	81.09	30.3
7.6	17.01	11.7	7.8	8.79	22.1	7.0	55.10	15.0	7.3	36.23	5.8	7.3	79.71	30.5
8.6	17.69	12.0	8.8	9.32	21.9	8.0	54.90	14.6	8.3	35.77	5.9	8.3	78.27	30.7
9.6	18.30	12.4	9.8	9.84	21.8	9.0	54.75	14.2	9.3	35.32	6.0	9.3	76.83	30.8
10.6	18.84	12.8	10.8	10.36	21.7	10.0	54.65	13.8	10.3	34.88	6.0	10.3	75.41	31.0
11.6	19.33	13.1	11.8	10.86	21.6	11.0	54.58	13.4	11.3	34.45	6.0	11.3	74.01	31.1
12.6	19.80	13.4	12.8	11.34	21.5	12.0	54.51	13.0	12.3	34.04	6.0	12.3	72.66	31.3
13.6	20.27	13.8	13.8	11.80	21.4	13.0	54.44	12.6	13.3	33.65	6.0	13.3	71.38	31.4
14.6	20.77	14.1	14.8	12.24	21.3	14.0	54.36	12.3	14.3	33.26	6.0	14.3	70.14	31.5
15.6	21.30	14.4	15.8	12.69	21.1	15.0	54.27	11.9	15.3	32.88	6.1	15.3	68.93	31.6
16.6	21.88	14.7	16.8	13.14	21.0	16.0	54.14	11.6	16.3	32.49	6.1	16.3	67.73	31.8
17.6	22.50	15.0	17.8	13.61	20.9	17.0	53.99	11.2	17.3	32.09	6.2	17.3	66.48	32.0
18.6	23.13	15.3	18.8	14.10	20.7	18.0	53.82	10.8	18.3	31.68	6.3	18.3	65.18	32.1
19.6	23.76	15.7	19.8	14.62	20.6	19.0	53.66	10.4	19.3	31.24	6.3	19.3	63.80	32.3
20.6	24.35	16.0	20.8	15.17	20.4	20.0	53.53	10.0	20.3	30.78	6.4	20.3	62.35	32.5
21.6	24.90	16.4	21.8	15.72	20.3	21.0	53.44	9.6	21.3	30.31	6.4	21.3	60.83	32.6
22.6	25.39	16.8	22.8	16.29	20.2	22.0	53.40	9.2	22.3	29.84	6.4	22.3	59.27	32.7
23.6	25.79	17.2	23.8	16.86	20.2	23.0	53.39	8.8	23.2	29.38	6.4	23.3	57.70	32.8
24.6	26.14	17.6	24.8	17.41	20.1	24.0	53.43	8.4	24.2	28.92	6.3	24.3	56.15	32.9
25.5	26.45	18.0	25.8	17.94	20.1	25.0	53.50	8.0	25.2	28.48	6.3	25.3	54.64	33.0
26.5	26.74	18.4	26.8	18.46	20.0	26.0	53.58	7.6	26.2	28.06	6.2	26.3	53.18	33.0
27.5	27.04	18.7	27.8	18.96	20.0	26.9	53.66	7.2	27.2	27.65	6.1	27.3	51.78	33.1
28.5	27.37	19.1	28.8	19.45	19.9	27.9	53.73	6.9	28.2	27.25	6.1	28.3	50.41	33.2
29.5	27.73	19.4	29.8	19.93	19.9	28.9	53.75	6.5	29.2	26.85	6.1	29.3	49.07	33.2
30.5	28.14	19.8	30.8	20.44	19.8	29.9	53.75	6.2	30.2	26.44	6.1	30.3	47.71	33.3
31.5	28.57	20.1	31.8	20.96	19.7	30.9	53.74	5.8	31.2	26.03	6.0	31.3	46.32	33.4
32.5	29.02	20.5	32.8	21.49	19.6	31.9	53.71	5.4	32.2	25.59	6.0	32.3	44.88	33.5

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Ursæ Min. (*Polaris*).		Mean Solar Date.	51 Cephei (Hev.).		Mean Solar Date.	6 Ursæ Min. (B.).		Mean Solar Date.	δ Ursæ Min.		Mean Solar Date.	λ Ursæ Min.	
	Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Oct.	1 27	+88 49	Oct.	6 58	+87 11	Oct.	12 13	+88 11	Oct.	18 1	+86 37	Oct.	19 11	+89 0
	s	″		s	″		s	″		s	″		s	″
1.5	28.57	20.1	1.8	20.96	19.7	1.9	53.71	65.4	1.2	26.03	6.0	1.3	46.32	33.4
2.5	29.02	20.5	2.8	21.49	19.6	2.9	53.70	65.0	2.2	25.59	6.0	2.3	44.88	33.5
3.5	29.46	20.9	3.8	22.05	19.5	3.9	53.72	64.6	3.2	25.14	6.0	3.3	43.37	33.6
4.5	29.85	21.3	4.8	22.62	19.5	4.9	53.78	64.2	4.2	24.67	6.0	4.3	41.80	33.7
5.5	30.17	21.7	5.8	23.21	19.4	5.9	53.89	63.8	5.2	24.20	5.9	5.3	40.18	33.8
6.5	30.43	22.1	6.8	23.80	19.4	6.9	54.05	63.4	6.2	23.74	5.8	6.3	38.55	33.9
7.5	30.61	22.5	7.7	24.37	19.4	7.9	54.25	62.9	7.2	23.28	5.8	7.3	36.94	33.9
8.5	30.73	23.0	8.7	24.92	19.4	8.9	54.47	62.5	8.2	22.83	5.7	8.3	35.35	33.9
9.5	30.81	23.4	9.7	25.45	19.5	9.9	54.69	62.2	9.2	22.41	5.5	9.3	33.82	33.9
10.5	30.88	23.7	10.7	25.95	19.5	10.9	54.90	61.8	10.2	22.01	5.4	10.3	32.37	33.9
11.5	30.96	24.1	11.7	26.44	19.5	11.9	55.09	61.5	11.2	21.63	5.3	11.3	30.99	33.9
12.5	31.07	24.4	12.7	26.92	19.5	12.9	55.24	61.1	12.2	21.26	5.2	12.3	29.63	33.9
13.5	31.23	24.8	13.7	27.41	19.5	13.9	55.38	60.7	13.2	20.89	5.1	13.2	28.29	33.9
14.5	31.42	25.1	14.7	27.91	19.5	14.9	55.50	60.4	14.2	20.50	5.0	14.2	26.93	34.0
15.5	31.63	25.5	15.7	28.42	19.4	15.9	55.63	60.0	15.2	20.09	4.9	15.2	25.55	34.0
16.5	31.85	25.9	16.7	28.95	19.4	16.9	55.77	59.6	16.2	19.68	4.8	16.2	24.11	34.0
17.5	32.04	26.3	17.7	29.50	19.4	17.9	55.94	59.2	17.2	19.26	4.7	17.2	22.60	34.1
18.5	32.18	26.7	18.7	30.08	19.4	18.9	56.17	58.7	18.2	18.82	4.6	18.2	21.03	34.1
19.5	32.26	27.1	19.7	30.66	19.5	19.9	56.44	58.3	19.2	18.37	4.5	19.2	19.41	34.1
20.5	32.27	27.5	20.7	31.24	19.5	20.9	56.75	57.9	20.2	17.93	4.4	20.2	17.78	34.1
21.5	32.21	28.0	21.7	31.81	19.6	21.9	57.09	57.6	21.2	17.50	4.2	21.2	16.16	34.0
22.5	32.10	28.4	22.7	32.36	19.7	22.9	57.44	57.2	22.2	17.09	4.0	22.2	14.58	34.0
23.5	31.96	28.8	23.7	32.89	19.8	23.9	57.80	56.8	23.2	16.69	3.8	23.2	13.06	33.9
24.5	31.81	29.1	24.7	33.40	19.9	24.9	58.16	56.5	24.2	16.32	3.6	24.2	11.60	33.8
25.5	31.69	29.5	25.7	33.89	20.0	25.9	58.49	56.2	25.2	15.95	3.4	25.2	10.19	33.8
26.5	31.60	29.8	26.7	34.37	20.0	26.9	58.78	55.9	26.2	15.59	3.3	26.2	8.83	33.7
27.5	31.55	30.2	27.7	34.85	20.1	27.9	59.05	55.6	27.2	15.24	3.1	27.2	7.48	33.7
28.5	31.54	30.5	28.7	35.34	20.1	28.9	59.31	55.2	28.2	14.87	3.0	28.2	6.11	33.6
29.5	31.55	30.9	29.7	35.86	20.2	29.9	59.58	54.9	29.1	14.49	2.8	29.2	4.70	33.6
30.5	31.54	31.3	30.7	36.40	20.2	30.9	59.87	54.5	30.1	14.10	2.7	30.2	3.24	33.5
31.5	31.50	31.7	31.7	36.95	20.3	31.9	60.20	54.1	31.1	13.69	2.5	31.2	1.73	33.5
32.4	31.40	32.1	32.7	37.50	20.4	32.9	60.56	53.8	32.1	13.29	2.3	32.2	0.17	33.4

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Ursæ Min. (*Polaris*).		Mean Solar Date.	51 Cephei (Hev.).		Mean Solar Date.	6 Ursæ Min. (B.).		Mean Solar Date.	δ Ursæ Min.		Mean Solar Date.	λ Ursæ Min.	
	Right Ascension.	Declination *North*.		Right Ascension.	Declination *North*.		Right Ascension.	Declination *North*.		Right Ascension.	Declination *North*.		Right Ascension.	Declination *North*.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Nov.	1 27	+88 49	Nov.	6 58	+87 11	Nov.	12 14	+88 11	Nov.	18 1	+86 36	Nov.	19 10	+89 0
	s	″		s	″		s	″		s	″		s	″
1.4	31 40	32.1	1.7	37.50	20.4	1.9	0.56	53.8	1.1	13.29	62.3	1.2	60.17	33.4
2.4	31.23	32.5	2.7	38.06	20.5	2.9	0.98	53.4	2.1	12.88	62.1	2.2	58.59	33.3
3.4	30.98	33.0	3.7	38.61	20.6	3.9	1.45	53.0	3.1	12.48	61.9	3.2	57.02	33.2
4.4	30.67	33.4	4.7	39.13	20.7	4.9	1.94	52.7	4.1	12.10	61.7	4.2	55.49	33.1
5.4	30.30	33.7	5.7	39.63	20.9	5.9	2.43	52.3	5.1	11.74	61.4	5.2	54.02	33.0
6.4	29.91	34.1	6.7	40.11	21.1	6.9	2.93	52.0	6.1	11.41	61.2	6.2	52.63	32.9
7.4	29.53	34.5	7.7	40.57	21.2	7.9	3.41	51.7	7.1	11.10	60.9	7.2	51.31	32.7
8.4	29.16	34.8	8.7	41.00	21.4	8.9	3.85	51.4	8.1	10.80	60.7	8.2	50.06	32.6
9.4	28.84	35.1	9.7	41.43	21.5	9.9	4.28	51.1	9.1	10.51	60.4	9.2	48.84	32.4
10.4	28.56	35.4	10.7	41.87	21.6	10.9	4.68	50.8	10.1	10.22	60.2	10.2	47.63	32.3
11.4	28.31	35.8	11.6	42.32	21.7	11.9	5.06	50.5	11.1	9.92	60.0	11.2	46.40	32.2
12.4	28.07	36.1	12.6	42.79	21.8	12.9	5.46	50.2	12.1	9.61	59.8	12.2	45.13	32.1
13.4	27.82	36.5	13.6	43.27	22.0	13.9	5.88	49.9	13.1	9.28	59.6	13.2	43.79	32.0
14.4	27.53	36.8	14.6	43.77	22.1	14.9	6.35	49.5	14.1	8.94	59.4	14.2	42.40	31.9
15.4	27.18	37.2	15.6	44.28	22.3	15.9	6.86	49.2	15.1	8.59	59.2	15.2	40.98	31.7
16.4	26.77	37.6	16.6	44.79	22.5	16.9	7.42	48.9	16.1	8.24	58.9	16.2	39.55	31.6
17.4	26.27	38.0	17.6	45.28	22.7	17.9	8.01	48.6	17.1	7.91	58.6	17.1	38.13	31.4
18.4	25.71	38.4	18.6	45.75	22.9	18.9	8.62	48.3	18.1	7.59	58.3	18.1	36.74	31.2
19.4	25.11	38.7	19.6	46.20	23.1	19.8	9.24	48.0	19.1	7.30	58.0	19.1	35.42	31.0
20.4	24.50	39.0	20.6	46.63	23.3	20.8	9.86	47.7	20.1	7.03	57.7	20.1	34.16	30.8
21.4	23.91	39.4	21.6	47.04	23.5	21.8	10.45	47.5	21.1	6.78	57.4	21.1	32.98	30.6
22.4	23.33	39.7	22.6	47.42	23.7	22.8	11.00	47.3	22.1	6.54	57.1	22.1	31.85	30.3
23.4	22.80	40.0	23.6	47.80	23.9	23.8	11.53	47.1	23.1	6.30	56.8	23.1	30.75	30.1
24.4	22.32	40.3	24.6	48.19	24.1	24.8	12.04	46.8	24.1	6.07	56.6	24.1	29.66	30.0
25.4	21.86	40.6	25.6	48.60	24.3	25.8	12.54	46.6	25.1	5.82	56.3	25.1	28.55	29.8
26.4	21.41	40.9	26.6	49.02	24.5	26.8	13.05	46.3	26.1	5.56	56.0	26.1	27.40	29.6
27.4	20.93	41.2	27.6	49.45	24.7	27.8	13.59	46.1	27.1	5.29	55.8	27.1	26.21	29.4
28.4	20.40	41.5	28.6	49.89	24.9	28.8	14.17	45.8	28.1	5.01	55.5	28.1	24.97	29.2
29.4	19.81	41.9	29.6	50.34	25.1	29.8	14.81	45.5	29.1	4.73	55.2	29.1	23.70	29.0
30.4	19.14	42.2	30.6	50.77	25.3	30.8	15.49	45.3	30.1	4.46	54.9	30.1	22.44	28.8
31.4	18.41	42.5	31.6	51.18	25.6	31.8	16.19	45.0	31.1	4.21	54.6	31.1	21.23	28.6

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	*a* Ursæ Min. (*Polaris*).		Mean Solar Date.	51 Cephei (Hev.).		Mean Solar Date.	6 Ursæ Min. (B.).		Mean Solar Date.	*δ* Ursæ Min.		Mean Solar Date.	*λ* Ursæ Min.	
	Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*
Dec.	h m 1 26	° ′ +88 49	Dec.	h m 6 58	° ′ +87 11	Dec.	h m 12 14	° ′ +88 11	Dec.	h m 18 1	° ′ +86 36	Dec.	h m 19 9	° ′ +89 0
	s	″		s	″		s	″		s	″		s	″
1.4	78.41	42.5	1.6	51.18	25.6	1.8	16.19	45.0	1.1	4.21	54.6	1.1	81.23	28.6
2.4	77.62	42.9	2.6	51.57	25.9	2.8	16.90	44.8	2.1	3.99	54.2	2.1	80.08	28.3
3.4	76.79	43.2	3.6	51.93	26.2	3.8	17.62	44.6	3.0	3.80	53.9	3.1	79.01	28.0
4.4	75.96	43.4	4.6	52.26	26.4	4.8	18.32	44.4	4.0	3.62	53.5	4.1	78.02	27.8
5.4	75.15	43.7	5.6	52.56	26.7	5.8	18.99	44.3	5.0	3.46	53.2	5.1	77.10	27.5
6.4	74.38	43.9	6.6	52.85	27.0	6.8	19.63	44.1	6.0	3.31	52.8	6.1	76.25	27.2
7.3	73.64	44.1	7.6	53.14	27.2	7.8	20.23	43.9	7.0	3.17	52.5	7.1	75.44	27.0
8.3	72.95	44.4	8.6	53.43	27.4	8.8	20.82	43.7	8.0	3.03	52.2	8.1	74.62	26.7
9.3	72.29	44.6	9.6	53.73	27.7	9.8	21.41	43.6	9.0	2.87	51.9	9.1	73.78	26.5
10.3	71.62	44.8	10.6	54.05	27.9	10.8	22.01	43.4	10.0	2.70	51.6	10.1	72.90	26.3
11.3	70.92	45.1	11.6	54.39	28.1	11.8	22.65	43.2	11.0	2.53	51.3	11.1	71.97	26.0
12.3	70.18	45.4	12.6	54.74	28.4	12.8	23.32	43.0	12.0	2.35	51.0	12.1	71.00	25.8
13.3	69.37	45.7	13.6	55.09	28.7	13.8	24.04	42.8	13.0	2.17	50.7	13.1	70.01	25.5
14.3	68.49	45.9	14.6	55.42	29.0	14.8	24.81	42.6	14.0	2.00	50.3	14.1	69.03	25.2
15.3	67.56	46.2	15.6	55.74	29.3	15.8	25.59	42.5	15.0	1.85	50.0	15.1	68.09	24.9
16.3	66.59	46.5	16.6	56.03	29.6	16.8	26.37	42.3	16.0	1.72	49.6	16.1	67.22	24.6
17.3	65.60	46.7	17.6	56.29	30.0	17.8	27.15	42.2	17.0	1.61	49.2	17.1	66.41	24.3
18.3	64.60	46.9	18.6	56.52	30.3	18.8	27.91	42.1	18.0	1.53	48.8	18.1	65.69	24.0
19.3	63.63	47.1	19.5	56.74	30.6	19.8	28.63	42.1	19.0	1.46	48.5	19.1	65.05	23.7
20.3	62.71	47.2	20.5	56.94	30.9	20.8	29.31	42.0	20.0	1.40	48.1	20.1	64.45	23.3
21.3	61.83	47.4	21.5	57.14	31.2	21.8	29.97	41.9	21.0	1.34	47.8	21.0	63.88	23.0
22.3	61.00	47.6	22.5	57.35	31.4	22.8	30.61	41.8	21.9	1.29	47.5	22.0	63.30	22.8
23.3	60.19	47.7	23.5	57.57	31.7	23.8	31.25	41.7	22.9	1.22	47.2	23.0	62.70	22.5
24.3	59.37	47.9	24.5	57.80	32.0	24.8	31.91	41.6	23.9	1.14	46.9	24.0	62.06	22.2
25.3	58.52	48.1	25.5	58.04	32.2	25.7	32.60	41.5	24.9	1.05	46.5	25.0	61.38	22.0
26.3	57.63	48.3	26.5	58.28	32.5	26.7	33.33	41.4	25.9	0.96	46.2	26.0	60.69	21.7
27.3	56.67	48.5	27.5	58.52	32.8	27.7	34.10	41.3	26.9	0.88	45.8	27.0	59.99	21.4
28.3	55.64	48.7	28.5	58.74	33.2	28.7	34.90	41.3	27.9	0.81	45.5	28.0	59.32	21.0
29.3	54.55	48.9	29.5	58.93	33.5	29.7	35.71	41.2	28.9	0.77	45.1	29.0	58.72	20.7
30.3	53.42	49.1	30.5	59.09	33.9	30.7	36.52	41.2	29.9	0.76	44.7	30.0	58.20	20.3
31.3	52.27	49.2	31.5	59.21	34.3	31.7	37.32	41.2	30.9	0.77	44.3	31.0	57.77	20.0
32.3	51.16	49.3	32.5	59.31	34.6	32.7	38.09	41.1	31.9	0.80	43.9	32.0	57.43	19.6

(CONSTANTS OF PARIS CONFERENCE.)

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	43 Cephei (H.).				μ Hydri.				47 Cephei (H.).				δ Mensæ.				Groombridge 944.			
	Right Ascension.		Declination *North*.		Right Ascension.		Declination *South*.		Right Ascension.		Declination *North*.		Right Ascension.		Declination *South*.		Right Ascension.		Declination *North*.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	0 55		+85 45		2 33		−79 29		2 53		+79 3		4 23		−80 25		5 32		+85 8	
	s		″		s		″		s		″		s		″		s		″	
Jan. 0.4	67.39	2.92	83.7	0.5	38.78	1.14	106.3	0.8	58.25	0.81	48.1	1.9	74.49	0.99	53.4	2.3	52.01	0.39	77.2	3.2
10.3	64.47	2.93	84.2	0.2	37.64	1.19	107.1	0.2	57.44	0.94	50.0	1.3	73.50	1.16	55.7	1.8	51.62	0.88	80.4	3.0
20.3	61.54	2.84	84.0	0.7	36.45	1.22	107.3	0.4	56.50	1.02	51.3	0.7	72.34	1.29	57.5	1.3	50.74	1.35	83.4	2.7
30.3	58.70	2.63	83.3	1.4	35.23	1.21	106.9	1.0	55.48	1.06	52.0	0.2	71.05	1.40	58.8	0.7	49.39	1.74	86.1	2.2
Feb. 9.2	56.07	2.33	81.9	2.0	34.02	1.17	105.9	1.5	54.42	1.06	52.2	0.5	69.65	1.45	59.5	0.2	47.65	2.06	88.3	1.7
19.2	53.74	1.93	79.9	2.4	32.85	1.09	104.4	2.1	53.36	1.02	51.7	1.0	68.20	1.47	59.7	0.4	45.59	2.29	90.0	1.2
Mar. 1.2	51.81	1.47	77.5	2.7	31.76	1.00	102.3	2.5	52.34	0.92	50.7	1.6	66.73	1.45	59.3	0.9	43.30	2.41	91.2	0.6
11.2	50.34	0.95	74.8	2.9	30.76	0.87	99.8	2.9	51.42	0.79	49.1	2.0	65.28	1.40	58.4	1.5	40.89	2.44	91.8	0.0
21.1	49.39	0.39	71.9	3.1	29.89	0.72	96.9	3.3	50.63	0.63	47.1	2.4	63.88	1.31	56.9	1.9	38.45	2.36	91.8	0.6
31.1	49.00	0.17	68.8	3.1	29.17	0.55	93.6	3.5	50.00	0.44	44.7	2.6	62.57	1.18	55.0	2.3	36.09	2.17	91.2	1.2
Apr. 10.1	49.17	0.72	65.7	2.9	28.62	0.38	90.1	3.7	49.56	0.23	42.1	2.8	61.39	1.04	52.7	2.7	33.92	1.92	90.0	1.7
20.1	49.89	1.24	62.8	2.7	28.24	0.18	86.4	3.8	49.33	0.00	39.3	2.8	60.35	0.86	50.0	3.1	32.00	1.58	88.3	2.1
30.0	51.13	1.70	60.1	2.3	28.06	0.01	82.6	3.8	49.33	0.21	36.5	2.7	59.49	0.67	46.9	3.3	30.42	1.18	86.2	2.4
May 10.0	52.83	2.10	57.8	1.9	28.07	0.21	78.8	3.7	49.54	0.43	33.8	2.5	58.82	0.46	43.6	3.4	29.24	0.75	83.8	2.7
20.0	54.93	2.43	55.9	1.4	28.28	0.40	75.1	3.6	49.97	0.62	31.3	2.3	58.36	0.24	40.2	3.6	28.49	0.30	81.1	2.9
29.9	57.36	2.68	54.5	0.9	28.68	0.59	71.5	3.3	50.59	0.80	29.0	2.0	58.12	0.01	36.6	3.5	28.19	0.17	78.2	2.9
June 8.9	60.04	2.85	53.6	0.4	29.27	0.75	68.2	3.0	51.39	0.96	27.0	1.6	58.11	0.21	33.1	3.6	28.36	0.63	75.3	2.8
18.9	62.89	2.94	53.2	0.2	30.02	0.90	65.2	2.7	52.35	1.08	25.4	1.2	58.32	0.43	29.5	3.3	28.99	1.07	72.5	2.8
28.9	65.83	2.95	53.4	0.8	30.92	1.03	62.5	2.2	53.43	1.18	24.2	0.7	58.75	0.63	26.2	3.1	30.06	1.49	69.7	2.6
July 8.8	68.78	2.89	54.2	1.3	31.95	1.13	60.3	1.7	54.61	1.25	23.5	0.2	59.38	0.82	23.1	2.8	31.55	1.86	67.1	2.3
18.8	71.67	2.76	55.5	1.8	33.08	1.18	58.6	1.2	55.86	1.29	23.3	0.3	60.20	0.98	20.3	2.4	33.41	2.19	64.8	2.0
28.8	74.43	2.57	57.3	2.2	34.26	1.22	57.4	0.5	57.15	1.31	23.6	0.8	61.18	1.12	17.9	1.9	35.60	2.48	62.8	1.7
Aug. 7.8	77.00	2.32	59.5	2.7	35.48	1.21	56.9	0.1	58.46	1.29	24.4	1.2	62.30	1.22	16.0	1.3	38.08	2.71	61.1	1.3
17.7	79.32	2.02	62.2	3.1	36.69	1.16	57.0	0.6	59.75	1.25	25.6	1.7	63.52	1.28	14.7	0.8	40.79	2.90	59.8	0.9
27.7	81.34	1.68	65.3	3.3	37.85	1.08	57.6	1.2	61.00	1.18	27.3	2.1	64.80	1.31	13.9	0.2	43.69	3.02	58.9	0.4
Sept. 6.7	83.02	1.31	68.6	3.6	38.93	0.97	58.8	1.8	62.18	1.10	29.4	2.4	66.11	1.28	13.7	0.5	46.71	3.09	58.5	0.0
16.6	84.33	0.91	72.2	3.8	39.90	0.81	60.6	2.3	63.28	1.00	31.8	2.8	67.39	1.21	14.2	1.1	49.80	3.09	58.5	0.5
26.6	85.24	0.49	76.0	3.8	40.71	0.63	62.9	2.7	64.28	0.87	34.6	3.1	68.60	1.11	15.3	1.6	52.89	3.05	59.0	0.9
Oct. 6.6	85.73	0.05	79.8	3.9	41.34	0.43	65.6	2.9	65.15	0.73	37.7	3.3	69.71	0.97	16.9	2.2	55.94	2.93	59.9	1.4
16.6	85.78	0.40	83.7	3.8	41.77	0.22	68.5	3.2	65.88	0.57	41.0	3.4	70.68	0.78	19.1	2.6	58.87	2.75	61.3	1.8
26.5	85.38	0.86	87.5	3.6	41.99	0.01	71.7	3.2	66.45	0.40	44.4	3.5	71.46	0.57	21.7	3.0	61.62	2.52	63.1	2.2
Nov. 5.5	84.52	1.30	91.1	3.4	41.98	0.24	74.9	3.1	66.85	0.21	47.9	3.5	72.03	0.33	24.7	3.2	64.14	2.21	65.3	2.6
15.5	83.22	1.71	94.5	3.0	41.74	0.44	78.0	2.9	67.06	0.02	51.4	3.4	72.36	0.08	27.9	3.3	66.35	1.84	67.9	2.9
25.5	81.51	2.09	97.5	2.6	41.30	0.65	80.9	2.7	67.08	0.17	54.8	3.3	72.44	0.17	31.2	3.3	68.19	1.43	70.8	3.1
Dec. 5.4	79.42	2.42	100.1	2.1	40.65	0.82	83.6	2.2	66.91	0.36	58.1	3.0	72.27	0.42	34.5	3.1	69.62	0.96	73.9	3.3
15.4	77.00	2.67	102.2	1.6	39.83	0.96	85.8	1.7	66.55	0.54	61.1	2.6	71.85	0.66	37.6	2.9	70.58	0.46	77.2	3.3
25.4	74.33	2.85	103.8	0.9	38.87	1.08	87.5	1.2	66.01	0.71	63.7	2.2	71.19	0.87	40.5	2.6	71.04	0.05	80.5	3.3
35.3	71.48		104.7		37.79		88.7		65.30		65.9		70.32		43.1		70.99		83.8	

(CONSTANTS OF PARIS CONFERENCE.)

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	ζ Mensæ.				25 Camelop. (H.)				1 Draconis (H.).				ζ Chamæleontis.				δ Chamæleontis.			
	Right Ascension.		Declination *South*.		Right Ascension.		Declination *North*.		Right Ascension.		Declination *North*.		Right Ascension.		Declination *South*.		Right Ascension.		Declination *South*.	
	h m 6 47		° ′ −80 42		h m 7 11		° ′ +82 35		h m 9 24		° ′ +81 43		h m 9 36		° ′ −80 31		h m 10 44		° ′ −80 3	
	s		″		s		″		s		″		s		″		s		″	
Jan. 0.6	48.08	0.30	63.6	3.5	65.85	0.53	19.8	3.1	15.47	1.25	38.4	2.1	41.82	0.71	37.5	3.4	59.65	1.01	12.9	2.8
10.6	47.78	0.56	67.1	3.3	66.38	0.19	22.9	3.1	16.72	1.01	40.5	2.5	42.53	0.48	40.9	3.6	60.66	0.83	15.7	3.2
20.5	47.22	0.80	70.4	3.1	66.57	0.16	26.0	3.1	17.73	0.73	43.0	2.9	43.01	0.25	44.5	3.7	61.49	0.64	18.9	3.5
30.5	46.42	1.01	73.5	2.7	66.41	0.50	29.1	3.0	18.46	0.43	45.9	3.0	43.26	0.01	48.2	3.9	62.13	0.44	22.4	3.8
Feb. 9.5	45.41	1.18	76.2	2.4	65.91	0.81	32.1	2.6	18.89	0.11	48.9	3.1	43.27	0.23	52.1	3.8	62.57	0.23	26.2	3.9
19.5	44.23	1.34	78.6	1.9	65.10	1.06	34.7	2.3	19.00	0.19	52.0	3.1	43.04	0.44	55.9	3.7	62.80	0.01	30.1	3.9
Mar. 1.4	42.89	1.44	80.5	1.5	64.04	1.28	37.0	1.8	18.81	0.48	55.1	2.9	42.60	0.65	59.6	3.5	62.81	0.19	34.0	3.8
11.4	41.45	1.51	82.0	0.9	62.76	1.43	38.8	1.3	18.33	0.73	58.0	2.6	41.95	0.83	63.1	3.3	62.62	0.38	37.8	3.8
21.4	39.94	1.55	82.9	0.4	61.33	1.52	40.1	0.7	17.60	0.95	60.6	2.2	41.12	0.99	66.4	2.8	62.24	0.56	41.6	3.5
31.3	38.39	1.54	83.3	0.1	59.81	1.53	40.8	0.1	16.65	1.12	62.8	1.8	40.13	1.11	69.2	2.5	61.68	0.72	45.1	3.2
Apr. 10.3	36.85	1.49	83.2	0.6	58.28	1.49	40.9	0.4	15.53	1.23	64.6	1.2	39.02	1.22	71.7	2.0	60.96	0.86	48.3	2.8
20.3	35.36	1.42	82.6	1.1	56.79	1.38	40.5	1.0	14.30	1.29	65.8	0.7	37.80	1.29	73.7	1.6	60.10	0.97	51.1	2.4
30.3	33.94	1.31	81.5	1.6	55.41	1.22	39.5	1.5	13.01	1.31	66.5	0.2	36.51	1.33	75.3	1.0	59.13	1.06	53.5	2.0
May 10.2	32.63	1.17	79.9	2.1	54.19	1.01	38.0	2.0	11.70	1.27	66.7	0.4	35.18	1.34	76.3	0.5	58.07	1.14	55.5	1.5
20.2	31.46	1.00	77.8	2.4	53.18	0.78	36.0	2.3	10.43	1.18	66.3	1.0	33.84	1.31	76.8	0.1	56.93	1.18	57.0	0.9
30.2	30.46	0.81	75.4	2.7	52.40	0.51	33.7	2.5	9.25	1.06	65.3	1.5	32.53	1.27	76.7	0.6	55.75	1.19	57.9	0.4
June 9.2	29.65	0.62	72.7	3.1	51.89	0.23	31.2	2.8	8.19	0.91	63.8	2.0	31.26	1.18	76.1	1.1	54.56	1.17	58.3	0.2
19.1	29.03	0.39	69.6	3.2	51.66	0.05	28.4	3.0	7.28	0.72	61.8	2.3	30.08	1.08	75.0	1.6	53.39	1.13	58.1	0.7
29.1	28.64	0.15	66.4	3.3	51.71	0.34	25.4	3.0	6.56	0.52	59.5	2.7	29.00	0.94	73.4	2.1	52.26	1.06	57.4	1.3
July 9.1	28.49	0.07	63.1	3.3	52.05	0.62	22.4	3.0	6.04	0.31	56.8	3.0	28.06	0.77	71.3	2.5	51.20	0.96	56.1	1.7
19.0	28.56	0.31	59.8	3.2	52.67	0.88	19.4	2.8	5.73	0.08	53.8	3.2	27.29	0.59	68.8	2.7	50.24	0.82	54.4	2.2
29.0	28.87	0.52	56.6	3.0	53.55	1.13	16.6	2.7	5.65	0.14	50.6	3.3	26.70	0.38	66.1	3.0	49.42	0.67	52.2	2.5
Aug. 8.0	29.39	0.74	53.6	2.8	54.68	1.35	13.9	2.5	5.79	0.37	47.3	3.4	26.32	0.16	63.1	3.1	48.75	0.48	49.7	2.8
18.0	30.13	0.93	50.8	2.4	56.03	1.55	11.4	2.3	6.16	0.59	43.9	3.4	26.16	0.07	60.0	3.2	48.27	0.27	46.9	3.0
27.9	31.06	1.08	48.4	1.9	57.58	1.72	9.1	1.9	6.75	0.81	40.5	3.3	26.23	0.30	56.8	3.1	48.00	0.06	43.9	3.1
Sept. 6.9	32.14	1.22	46.5	1.4	59.30	1.86	7.2	1.6	7.56	1.01	37.2	3.2	26.53	0.53	53.7	2.8	47.94	0.16	40.8	3.1
16.9	33.36	1.30	45.1	0.8	61.16	1.97	5.6	1.1	8.57	1.20	34.0	3.0	27.06	0.75	50.9	2.6	48.10	0.39	37.7	2.9
26.9	34.66	1.34	44.3	0.1	63.13	2.04	4.5	0.8	9.77	1.37	31.0	2.7	27.81	0.95	48.3	2.1	48.49	0.62	34.8	2.7
Oct. 6.8	36.00	1.33	44.2	0.5	65.17	2.08	3.7	0.3	11.14	1.52	28.3	2.4	28.76	1.10	46.2	1.6	49.11	0.82	32.1	2.3
16.8	37.33	1.29	44.7	1.2	67.25	2.07	3.4	0.2	12.66	1.65	25.9	1.9	29.86	1.24	44.6	1.1	49.93	0.99	29.8	1.8
26.8	38.62	1.18	45.9	1.7	69.32	2.02	3.6	0.7	14.31	1.74	24.0	1.5	31.10	1.33	43.5	0.4	50.92	1.15	28.0	1.3
Nov. 5.7	39.80	1.03	47.6	2.3	71.34	1.93	4.3	1.1	16.05	1.80	22.5	1.0	32.43	1.36	43.1	0.2	52.07	1.25	26.7	0.6
15.7	40.83	0.85	49.9	2.8	73.27	1.78	5.4	1.7	17.85	1.82	21.5	0.4	33.79	1.35	43.3	0.9	53.32	1.32	26.1	0.0
25.7	41.68	0.63	52.7	3.1	75.05	1.59	7.1	2.0	19.67	1.78	21.1	0.1	35.14	1.28	44.2	1.6	54.64	1.33	26.1	0.7
Dec. 5.7	42.31	0.38	55.8	3.4	76.64	1.35	9.1	2.4	21.45	1.71	21.2	0.7	36.42	1.18	45.8	2.1	55.97	1.30	26.8	1.3
15.6	42.69	0.12	59.2	3.5	77.99	1.07	11.5	2.8	23.16	1.58	21.9	1.3	37.60	1.02	47.9	2.7	57.27	1.23	28.1	1.9
25.6	42.81	0.15	62.7	3.5	79.06	0.76	14.3	3.0	24.74	1.40	23.2	1.7	38.62	0.84	50.6	3.1	58.50	1.10	30.0	2.5
35.6	42.66		66.2		79.82		17.3		26.14		24.9		39.46		53.7		59.60		32.5	

FIXED STARS, 1909.

(CONSTANTS OF PARIS CONFERENCE.)

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	η Octantis.				β Chamæleontis.				32^{2} Camelop. (H.)				κ Octantis.				δ Octantis.			
	Right Ascension.		Declination *South.*		Right Ascension.		Declination *South.*		Right Ascension.		Declination *North.*		Right Ascension.		Declination *South.*		Right Ascension.		Declination *South.*	
	h m 10 59		° ′ −84 5		h m 12 12		° ′ −78 47		h m 12 48		° ′ +83 53		h m 13 25		° ′ −85 18		h m 14 12		° ′ −83 14	
	s		″		s		″		s		″		s		″		s		″	
Jan. 0.7	63.45	1.72	50.9	2.5	58.79	1.18	58.8	1.7	26.44	2.23	73.1	0.6	55.53	2.91	47.2	0.6	6.18	2.07	43.0	0.1
10.7	65.17	1.45	53.4	3.0	59.97	1.09	60.5	2.3	28.67	2.20	72.5	0.0	58.44	2.87	47.8	1.2	8.25	2.10	42.9	0.6
20.7	66.62	1.16	56.4	3.4	61.06	0.98	62.8	2.8	30.87	2.11	72.5	0.7	61.31	2.75	49.0	1.7	10.35	2.09	43.5	1.1
30.7	67.78	0.83	59.8	3.6	62.04	0.84	65.6	3.2	32.98	1.93	73.2	1.4	64.06	2.56	50.7	2.3	12.44	2.02	44.6	1.6
Feb. 9.6	68.61	0.48	63.4	3.9	62.88	0.68	68.8	3.5	34.91	1.69	74.6	1.9	66.62	2.32	53.0	2.7	14.46	1.90	46.2	2.2
19.6	69.09	0.14	67.3	3.9	63.56	0.52	72.3	3.7	36.60	1.40	76.5	2.3	68.94	2.02	55.7	3.1	16.36	1.74	48.4	2.5
Mar. 1.6	69.23	0.20	71.2	3.9	64.08	0.35	76.0	3.8	38.00	1.06	78.8	2.7	70.96	1.68	58.8	3.4	18.10	1.54	50.9	3.0
11.5	69.03	0.52	75.1	3.8	64.43	0.18	79.8	3.9	39.06	0.68	81.5	3.0	72.64	1.32	62.2	3.6	19.64	1.33	53.9	3.2
21.5	68.51	0.83	78.9	3.6	64.61	0.01	83.7	3.8	39.74	0.29	84.5	3.1	73.96	0.94	65.8	3.7	20.97	1.08	57.1	3.4
31.5	67.68	1.11	82.5	3.4	64.62	0.16	87.5	3.7	40.03	0.09	87.6	3.1	74.90	0.55	69.5	3.8	22.05	0.82	60.5	3.6
Apr. 10.5	66.57	1.36	85.9	3.1	64.46	0.32	91.2	3.5	39.94	0.46	90.7	3.0	75.45	0.14	73.3	3.8	22.87	0.56	64.1	3.6
20.4	65.21	1.58	89.0	2.6	64.14	0.46	94.7	3.2	39.48	0.79	93.7	2.7	75.59	0.25	77.1	3.6	23.43	0.27	67.7	3.6
30.4	63.63	1.75	91.6	2.2	63.68	0.58	97.9	2.8	38.69	1.10	96.4	2.4	75.34	0.64	80.7	3.5	23.70	0.00	71.3	3.6
May 10.4	61.88	1.90	93.8	1.8	63.10	0.70	100.7	2.5	37.59	1.36	98.8	2.0	74.70	1.02	84.2	3.2	23.70	0.28	74.9	3.3
20.4	59.98	1.99	95.6	1.2	62.40	0.81	103.2	2.0	36.23	1.55	100.8	1.6	73.68	1.36	87.4	2.9	23.42	0.56	78.2	3.2
30.3	57.99	2.05	96.8	0.7	61.59	0.89	105.2	1.6	34.68	1.71	102.4	1.0	72.32	1.67	90.3	2.5	22.86	0.80	81.4	2.8
June 9.3	55.94	2.05	97.5	0.1	60.70	0.94	106.8	1.0	32.97	1.81	103.4	0.5	70.65	1.95	92.8	2.1	22.06	1.05	84.2	2.5
19.3	53.89	1.99	97.6	0.4	59.76	0.98	107.8	0.5	31.16	1.86	103.9	0.1	68.70	2.17	94.9	1.6	21.01	1.24	86.7	2.0
29.2	51.90	1.90	97.2	0.9	58.78	0.99	108.3	0.1	29.30	1.86	103.8	0.7	66.53	2.33	96.5	1.0	19.77	1.42	88.7	1.6
July 9.2	50.00	1.74	96.3	1.5	57.79	0.97	108.2	0.6	27.44	1.80	103.1	1.2	64.20	2.43	97.5	0.5	18.35	1.56	90.3	1.0
19.2	48.26	1.54	94.8	2.0	56.82	0.92	107.6	1.2	25.64	1.71	101.9	1.7	61.77	2.46	98.0	0.1	16.79	1.64	91.3	0.5
29.2	46.72	1.28	92.8	2.3	55.90	0.84	106.4	1.7	23.93	1.58	100.2	2.2	59.31	2.40	97.9	0.6	15.15	1.67	91.8	0.1
Aug. 8.1	45.44	0.98	90.5	2.7	55.06	0.73	104.7	2.1	22.35	1.41	98.0	2.6	56.91	2.27	97.3	1.2	13.48	1.64	91.7	0.6
18.1	44.46	0.64	87.8	2.9	54.33	0.60	102.6	2.4	20.94	1.20	95.4	3.0	54.64	2.06	96.1	1.7	11.84	1.57	91.1	1.1
28.1	43.82	0.28	84.9	3.1	53.73	0.43	100.2	2.8	19.74	0.97	92.4	3.3	52.58	1.76	94.4	2.2	10.27	1.41	90.0	1.7
Sept. 7.1	43.54	0.10	81.8	3.1	53.30	0.25	97.4	2.9	18.77	0.71	89.1	3.6	50.82	1.39	92.2	2.5	8.86	1.22	88.3	2.1
17.0	43.64	0.50	78.7	3.0	53.05	0.04	94.5	3.0	18.06	0.42	85.5	3.8	49.43	0.97	89.7	2.8	7.64	0.96	86.2	2.5
27.0	44.14	0.87	75.7	2.8	53.01	0.16	91.5	3.0	17.64	0.12	81.7	3.9	48.46	0.49	86.9	3.0	6.68	0.66	83.7	2.8
Oct. 7.0	45.01	1.22	72.9	2.5	53.17	0.38	88.5	2.8	17.52	0.18	77.8	3.9	47.97	0.01	83.9	3.0	6.02	0.32	80.9	3.0
16.9	46.23	1.54	70.4	2.0	53.55	0.58	85.7	2.5	17.70	0.50	73.9	3.9	47.98	0.53	80.9	3.0	5.70	0.04	77.9	3.0
26.9	47.77	1.81	68.4	1.5	54.13	0.77	83.2	2.2	18.20	0.83	70.0	3.7	48.51	1.04	77.9	2.8	5.74	0.40	74.9	2.9
Nov. 5.9	49.58	2.00	66.9	0.9	54.90	0.94	81.0	1.6	19.03	1.15	66.3	3.5	49.55	1.53	75.1	2.5	6.14	0.77	72.0	2.7
15.9	51.58	2.13	66.0	0.3	55.84	1.08	79.4	1.1	20.18	1.44	62.8	3.2	51.08	1.95	72.6	2.1	6.91	1.11	69.3	2.5
25.8	53.71	2.17	65.7	0.4	56.92	1.17	78.3	0.5	21.62	1.70	59.6	2.7	53.03	2.31	70.5	1.6	8.02	1.42	66.8	2.0
Dec. 5.8	55.88	2.15	66.1	1.0	58.09	1.23	77.8	0.2	23.32	1.92	56.9	2.2	55.34	2.60	68.9	1.0	9.44	1.68	64.8	1.6
15.8	58.03	2.04	67.1	1.7	59.32	1.24	78.0	0.8	25.24	2.09	54.7	1.7	57.94	2.80	67.9	0.4	11.12	1.87	63.2	1.0
25.8	60.07	1.86	68.8	2.2	60.56	1.22	78.8	1.4	27.33	2.19	53.0	1.0	60.74	2.90	67.5	0.2	12.99	2.03	62.2	0.4
35.7	61.93		71.0		61.78		80.2		29.52		52.0		63.64		67.7		15.02		61.8	

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Apodis.				ρ Octantis.				γ Apodis.				ε Ursæ Minoris.				σ Octantis.			
	Right Ascension.		Declination *South*.		Right Ascension.		Declination *South*.		Right Ascension.		Declination *South*.		Right Ascension.		Declination *North*.		Right Ascension.		Declination *South*.	
	h m 14 36		° ′ −78 39		h m 15 21		° ′ −84 9		h m 16 19		° ′ −78 41		h m 16 55		° ′ +82 10		h 19		° ′ −89 14	
	s		″		s		″		s		″		s		″		m s		″	
Jan. 0.9	24.78	1.27	11.1	0.3	56.89	2.23	30.5	1.1	19.10	1.06	25.4	1.7	8.71	0.70	70.2	3.4	12 35.0	3.5	29.9	3.4
10.9	26.05	1.30	10.8	0.3	59.12	2.39	29.4	0.6	20.16	1.19	23.7	1.2	9.41	0.98	66.8	3.0	12 38.5	6.6	26.5	3.3
20.9	27.35	1.32	11.1	0.8	61.51	2.49	28.8	0.0	21.35	1.29	22.5	0.8	10.39	1.21	63.8	2.5	12 45.1	9.4	23.2	3.2
30.8	28.67	1.29	11.9	1.3	64.00	2.52	28.8	0.5	22.64	1.34	21.7	0.3	11.60	1.40	61.3	2.0	12 54.5	11.9	20.0	2.9
Feb. 9.8	29.96	1.23	13.2	1.9	66.52	2.49	29.3	1.1	23.98	1.37	21.4	0.3	13.00	1.54	59.3	1.5	13 6.4	14.2	17.1	2.6
19.8	31.19	1.15	15.1	2.2	69.01	2.41	30.4	1.6	25.35	1.37	21.7	0.7	14.54	1.61	57.8	0.7	13 20.6	16.0	14.5	2.1
Mar. 1.8	32.34	1.05	17.3	2.7	71.42	2.27	32.0	2.0	26.72	1.34	22.4	1.1	16.15	1.63	57.1	0.1	13 36.6	17.4	12.4	1.8
11.7	33.39	0.93	20.0	2.9	73.69	2.09	34.0	2.4	28.06	1.28	23.5	1.6	17.78	1.59	57.0	0.5	13 54.0	18.4	10.6	1.4
21.7	34.32	0.79	22.9	3.2	75.78	1.88	36.4	2.7	29.34	1.20	25.1	1.9	19.37	1.48	57.5	1.2	14 12.4	19.1	9.2	0.9
31.7	35.11	0.64	26.1	3.3	77.66	1.62	39.1	3.0	30.54	1.10	27.0	2.3	20.85	1.33	58.7	1.7	14 31.5	19.3	8.3	0.4
Apr. 10.6	35.75	0.49	29.4	3.5	79.28	1.33	42.1	3.2	31.64	0.98	29.3	2.5	22.18	1.14	60.4	2.2	14 50.8	19.2	7.9	0.1
20.6	36.24	0.33	32.9	3.4	80.61	1.04	45.3	3.4	32.62	0.84	31.8	2.8	23.32	0.91	62.6	2.6	15 10.0	18.6	8.0	0.6
30.6	36.57	0.16	36.3	3.4	81.65	0.71	48.7	3.4	33.46	0.69	34.6	3.0	24.23	0.65	65.2	2.9	15 28.6	17.6	8.6	1.0
May 10.6	36.73	0.01	39.7	3.3	82.36	0.38	52.1	3.5	34.15	0.53	37.6	3.1	24.88	0.38	68.1	3.0	15 46.2	16.4	9.6	1.5
20.5	36.72	0.17	43.0	3.1	82.74	0.04	55.6	3.3	34.68	0.35	40.7	3.1	25.26	0.10	71.1	3.2	16 2.6	14.7	11.1	1.9
30.5	36.55	0.33	46.1	2.9	82.78	0.31	58.9	3.2	35.03	0.18	43.8	3.1	25.36	0.19	74.3	3.1	16 17.3	12.8	13.0	2.3
June 9.5	36.22	0.48	49.0	2.5	82.47	0.64	62.1	3.0	35.21	0.01	46.9	3.0	25.17	0.46	77.4	3.0	16 30.1	10.5	15.3	2.6
19.5	35.74	0.62	51.5	2.2	81.83	0.95	65.1	2.7	35.20	0.19	49.9	2.8	24.71	0.72	80.4	2.8	16 40.6	8.0	17.9	2.8
29.4	35.12	0.74	53.7	1.7	80.88	1.23	67.8	2.3	35.01	0.37	52.7	2.6	23.99	0.96	83.2	2.5	16 48.6	5.3	20.7	3.0
July 9.4	34.38	0.84	55.4	1.2	79.65	1.49	70.1	1.9	34.64	0.53	55.3	2.2	23.03	1.17	85.7	2.2	16 53.9	2.4	23.7	3.1
19.4	33.54	0.91	56.6	0.7	78.16	1.69	72.0	1.3	34.11	0.68	57.5	1.9	21.86	1.37	87.9	1.8	16 56.3	0.6	26.8	3.1
29.3	32.63	0.96	57.3	0.2	76.47	1.84	73.3	0.9	33.43	0.80	59.4	1.4	20.49	1.52	89.7	1.3	16 55.7	3.4	29.9	3.0
Aug. 8.3	31.67	0.96	57.5	0.4	74.63	1.92	74.2	0.3	32.63	0.89	60.8	1.0	18.97	1.65	91.0	0.9	16 52.3	6.3	32.9	2.8
18.3	30.71	0.94	57.1	0.9	72.71	1.94	74.5	0.2	31.74	0.97	61.8	0.4	17.32	1.74	91.9	0.4	16 46 0	8.8	35.7	2.5
28.3	29.77	0.87	56.2	1.4	70.77	1.89	74.3	0.8	30.77	0.98	62.2	0.1	15.58	1.78	92.3	0.1	16 37.2	11.1	38.2	2.2
Sept. 7.2	28.90	0.77	54.8	1.8	68.88	1.77	73.5	1.4	29.79	0.97	62.1	0.6	13.80	1.80	92.2	0.6	16 26.1	13.1	40.4	1.6
17.2	28.13	0.64	53.0	2.3	67.11	1.55	72.1	1.9	28.82	0.91	61.5	1.2	12.00	1.76	91.6	1.1	16 13.0	14.4	42.0	1.1
27.2	27.49	0.47	50.7	2.6	65.56	1.28	70.2	2.2	27.91	0.81	60.3	1.6	10.24	1.68	90.5	1.6	15 58.6	15.3	43.1	0.6
Oct. 7.2	27.02	0.27	48.1	2.7	64.28	0.96	68.0	2.7	27.10	0.68	58.7	2.1	8.56	1.57	88.9	2.1	15 43.3	15.6	43.7	0.1
17.1	26.75	0.06	45.4	2.9	63.32	0.57	65.3	2.8	26.42	0.50	56.6	2.4	6.99	1.41	86.8	2.5	15 27.7	15.2	43.6	0.7
27.1	26.69	0.17	42.5	2.9	62.75	0.15	62.5	3.0	25.92	0.30	54.2	2.7	5.58	1.21	84.3	2.9	15 12.5	14.1	42.9	1.3
Nov. 6.1	26.86	0.39	39.6	2.7	62.60	0.27	59.5	3.0	25.62	0.08	51.5	2.8	4.37	0.98	81.4	3.2	14 58.4	12.5	41.6	1.9
16.0	27.25	0.60	36.9	2.5	62.87	0.71	56.5	2.9	25.54	0.15	48.7	2.8	3.39	0.71	78.2	3.5	14 45.9	10.3	39.7	2.3
26.0	27.85	0.81	34.4	2.1	63.58	1.12	53.6	2.6	25.69	0.37	45.9	2.8	2.68	0.41	74.7	3.6	14 35.6	7.8	37.4	2.8
Dec. 6.0	28.66	0.98	32.3	1.7	64.70	1.50	51.0	2.3	26.06	0.60	43.1	2.6	2.27	0.11	71.1	3.7	14 27.8	4.8	34.6	3.1
16.0	29.64	1.12	30.6	1.2	66.20	1.83	48.7	1.9	26.66	0.80	40.5	2.3	2.16	0.20	67.4	3.6	14 23.0	1.7	31.5	3.3
25.9	30.76	1.22	29.4	0.6	68.03	2.11	46.8	1.5	27.46	0.98	38.2	1.9	2.36	0.51	63.8	3.5	14 21.3	1.5	28.2	3.4
35.9	31.98		28.8		70.14		45.3		28.44		36.3		2.87		60.3		14 22.8		24.8	

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	12 Year Cat. 1879.				λ¹ Octantis.				ν Octantis.				β Octantis.				γ¹ Octantis			
	Right Ascension.		Declination *North.*		Right Ascension.		Declination *South.*		Right Ascension.		Declination *South.*		Right Ascension.		Declination *South.*		Right Ascension.		Declination *South.*	
	h m 20 51		° ′ +80 12		h m 21 36		° ′ −83 7		h m 22 14		° ′ −86 25		h m 22 36		° ′ −81 51		h m 23 46		° ′ −82 31	
	s		″		s		″		s		″		s		″		s		″	
Jan. 1.2	38.74	0.71	47.4	2.9	51.96	0.69	97.2	2.9	12.45	1.97	74.2	2.8	41.47	0.93	56.2	2.4	44.01	1.38	54.9	1.7
11.1	38.03	0.49	44.5	3.2	51.27	0.41	94.3	3.3	10.48	1.45	71.4	3.1	40.54	0.73	53.8	2.9	42.63	1.24	53.2	2.2
21.1	37.54	0.26	41.3	3.3	50.86	0.09	91.0	3.5	9.03	0.90	68.3	3.5	39.81	0.51	50.9	3.2	41.39	1.05	51.0	2.7
31.1	37.28	0.01	38.0	3.4	50.77	0.20	87.5	3.6	8.13	0.33	64.8	3.7	39.30	0.27	47.7	3.5	40.34	0.85	48.3	3.2
Feb. 10.0	37.27	0.24	34.6	3.3	50.97	0.51	83.9	3.6	7.80	0.24	61.1	3.7	39.03	0.03	44.2	3.7	39.49	0.62	45.1	3.4
20.0	37.51	0.48	31.3	3.1	51.48	0.79	80.3	3.6	8.04	0.81	57.4	3.8	39.00	0.22	40.5	3.7	38.87	0.38	41.7	3.7
Mar. 2.0	37.99	0.69	28.2	2.8	52.27	1.05	76.7	3.4	8.85	1.33	53.6	3.7	39.22	0.45	36.8	3.8	38.49	0.12	38.0	3.8
12.0	38.68	0.88	25.4	2.4	53.32	1.30	73.3	3.2	10.18	1.84	49.9	3.5	39.67	0.67	33.0	3.6	38.37	0.13	34.2	3.9
21.9	39.56	1.04	23.0	1.8	54.62	1.50	70.1	2.9	12.02	2.30	46.4	3.3	40.34	0.88	29.4	3.5	38.50	0.38	30.3	3.8
31.9	40.60	1.15	21.2	1.3	56.12	1.69	67.2	2.6	14.32	2.70	43.1	3.1	41.22	1.08	25.9	3.3	38.88	0.62	26.5	3.8
Apr. 10.9	41.75	1.23	19.9	0.6	57.81	1.84	64.6	2.2	17.02	3.05	40.0	2.6	42.30	1.25	22.6	2.9	39.50	0.86	22.7	3.5
20.9	42.98	1.25	19.3	0.0	59.65	1.96	62.4	1.7	20.07	3.34	37.4	2.2	43.55	1.41	19.7	2.5	40.36	1.08	19.2	3.3
30.8	44.23	1.25	19.3	0.6	61.61	2.03	60.7	1.3	23.41	3.55	35.2	1.8	44.96	1.52	17.2	2.2	41.44	1.27	15.9	3.0
May 10.8	45.48	1.20	19.9	1.2	63.64	2.06	59.4	0.8	26.96	3.70	33.4	1.3	46.48	1.62	15.0	1.7	42.71	1.44	12.9	2.5
20.8	46.68	1.11	21.1	1.8	65.70	2.04	58.6	0.2	30.66	3.76	32.1	0.8	48.10	1.67	13.3	1.2	44.15	1.58	10.4	2.1
30.7	47.79	0.98	22.9	2.2	67.74	1.99	58.4	0.2	34.42	3.74	31.3	0.2	49.77	1.69	12.1	0.6	45.73	1.69	8.3	1.6
June 9.7	48.77	0.84	25.1	2.7	69.73	1.89	58.6	0.8	38.16	3.63	31.1	0.3	51.46	1.68	11.5	0.1	47.42	1.74	6.7	1.1
19.7	49.61	0.65	27.8	3.0	71.62	1.73	59.4	1.3	41.79	3.44	31.4	0.9	53.14	1.61	11.4	0.4	49.16	1.77	5.6	0.5
29.7	50.26	0.47	30.8	3.2	73.35	1.55	60.7	1.7	45.23	3.15	32.3	1.4	54.75	1.50	11.8	1.0	50.93	1.74	5.1	0.0
July 9.6	50.73	0.26	34.0	3.5	74.90	1.30	62.4	2.1	48.38	2.77	33.7	1.8	56.25	1.36	12.8	1.5	52.67	1.66	5.1	0.6
19.6	50.99	0.06	37.5	3.6	76.20	1.03	64.5	2.5	51.15	2.32	35.5	2.2	57.61	1.17	14.3	1.9	54.33	1.54	5.7	1.2
29.6	51.05	0.16	41.1	3.6	77.23	0.73	67.0	2.7	53.47	1.80	37.7	2.6	58.78	0.95	16.2	2.3	55.87	1.37	6.9	1.6
Aug. 8.6	50.89	0.37	44.7	3.5	77.96	0.40	69.7	2.9	55.27	1.22	40.3	2.9	59.73	0.71	18.5	2.6	57.24	1.16	8.5	2.1
18.5	50.52	0.57	48.2	3.4	78.36	0.07	72.6	3.0	56.49	0.61	43.2	3.0	60.44	0.44	21.1	2.9	58.40	0.91	10.6	2.5
28.5	49.95	0.75	51.6	3.2	78.43	0.26	75.6	2.9	57.10	0.04	46.2	3.0	60.88	0.16	24.0	2.9	59.31	0.63	13.1	2.8
Sept. 7.5	49.20	0.91	54.8	2.9	78.17	0.59	78.5	2.8	57.06	0.68	49.2	3.0	61.04	0.13	26.9	3.0	59.94	0.34	15.9	3.0
17.4	48.29	1.07	57.7	2.5	77.58	0.90	81.3	2.6	56.38	1.29	52.2	2.8	60.91	0.41	29.9	2.9	60.28	0.03	18.9	3.1
27.4	47.22	1.19	60.2	2.2	76.68	1.15	83.9	2.2	55.09	1.87	55.0	2.5	60.50	0.66	32.8	2.7	60.31	0.29	22.0	3.0
Oct. 7.4	46.03	1.29	62.4	1.8	75.53	1.37	86.1	1.7	53.22	2.36	57.5	2.2	59.84	0.90	35.5	2.3	60.02	0.58	25.0	2.8
17.4	44.74	1.35	64.2	1.2	74.16	1.53	87.8	1.3	50.86	2.76	59.7	1.6	58.94	1.10	37.8	2.0	59.44	0.85	27.8	2.6
27.3	43.39	1.39	65.4	0.6	72.63	1.63	89.1	0.6	48.10	3.06	61.3	1.1	57.84	1.24	39.8	1.4	58.59	1.09	30.4	2.2
Nov. 6.3	42.00	1.38	66.0	0.1	71.00	1.65	89.7	0.0	45.04	3.23	62.4	0.5	56.60	1.34	41.2	0.8	57.50	1.29	32.6	1.7
16.3	40.62	1.35	66.1	0.5	69.35	1.61	89.7	0.5	41.81	3.27	62.9	0.2	55.26	1.39	42.0	0.3	56.21	1.43	34.3	1.2
26.3	39.27	1.28	65.6	1.0	67.74	1.50	89.2	1.2	38.54	3.18	62.7	0.8	53.87	1.37	42.3	0.4	54.78	1.52	35.5	0.5
Dec. 6.2	37.99	1.16	64.6	1.7	66.24	1.34	88.0	1.8	35.36	2.97	61.9	1.4	52.50	1.31	41.9	1.0	53.26	1.55	36.0	0.1
16.2	36.83	1.02	62.9	2.1	64.90	1.12	86.2	2.3	32.39	2.67	60.5	2.0	51.19	1.20	40.9	1.6	51.71	1.53	35.9	0.7
26.2	35.81	0.84	60.8	2.6	63.78	0.87	83.9	2.8	29.72	2.25	58.5	2.6	49.99	1.04	39.3	2.2	50.18	1.45	35.2	1.3
36.1	34.97		58.2		62.91		81.1		27.47		55.9		48.95		37.1		48.73		33.9	

ON THE ARRANGEMENT AND USE OF THE AMERICAN EPHEMERIS AND NAUTICAL ALMANAC.

ON THE ARRANGEMENT AND USE OF THE AMERICAN EPHEMERIS AND NAUTICAL ALMANAC.

The first part of this Ephemeris, embracing the positions of the Sun and Moon, the distances of the Moon from the center of the Sun, from the centers of the four most conspicuous planets, and from certain fixed stars, together with the ephemerides of the planets Mercury, Venus, Mars, Jupiter, and Saturn, is designed for the special use of navigators. The remainder of the work is intended to meet the wants of astronomers. It contains the ephemerides of Uranus and Neptune, the heliocentric co-ordinates of the seven major planets, the rectangular equatorial co-ordinates of the Sun, the Moon's longitude and latitude, data for the libration of the Moon, the obliquity of the ecliptic, the nutation, the positions of 383 standard stars, the ephemeris for the meridian of Washington, etc.

TIME.

Astronomers make use of three different kinds of time, namely: First, true or apparent solar time; second, mean solar time; third, sidereal time.

True or Apparent Solar Time.—This species of time is called indiscriminately either true solar time or apparent solar time, and is measured by the motion of the true Sun; the length of the day being the interval between two successive transits of the Sun over the same meridian, and the time of day being always the hour angle of the Sun from the meridian. This is the most obvious and natural measure of time, but owing to the obliquity of the ecliptic and the varying motion of the Earth in its orbit, the intervals between successive returns of the Sun to the same meridian are not exactly equal, and consequently ordinary clocks and chronometers can not be regulated to true solar time.

Mean Solar Time.—To avoid the irregularity which would arise from using the true solar day, astronomers have recourse to a mean solar day, whose length is equal to the average of all the true solar days in a year. Just as the true solar day depends upon the motion of the true Sun, so the mean solar day is made to depend upon the motion of an imaginary mean Sun which moves along the equator at a perfectly uniform rate, and whose hour angle from any given meridian is always the mean solar time thereat. Ordinary clocks and watches and the chronometers used by navigators are regulated to this species of time.

Equation of Time.—The imaginary mean Sun is supposed to keep as near the true Sun as is consistent with perfect uniformity of motion, but it is sometimes before and sometimes behind the latter, the greatest difference amounting to rather more than one-quarter of an hour. The interval between the true Sun and the imaginary mean Sun is the equation of time, given on pages I and II of the Ephemeris for the meridian of Greenwich, and a knowledge of it is necessary for converting true solar time into mean solar time, or vice versa. As the mean Sun is an imaginary body, mean solar time can not be directly observed, but it can be got either from observations of the true Sun by applying to them the correction for the equation of time, or from observations of the stars by means of the sidereal time of mean noon, given on page II of the Ephemeris for the meridian of Greenwich.

Sidereal Time.—Sidereal time is measured, roughly speaking, by the daily motion of the stars; or in strict accuracy, by the daily motion of that point in the equator from which the true right ascensions of the stars are counted. The point in question is the vernal equinox, and its hour angle is always the sidereal time. Astronomical clocks are usually regulated to sidereal time, and are then called sidereal clocks.

Sidereal Day.—A sidereal day is the interval between two successive transits of the vernal equinox over the same meridian. It is 3^m $55^s.909$ of mean solar time shorter than the mean solar day, the tropical year of 365.2422 solar days being divided into 366.2422 sidereal days, each comprising 24 sidereal hours. The sidereal hours are counted from 0 to 24, commencing with the instant of the passage of the true vernal equinox over the upper meridian, and ending with its return to the same meridian. About March 23 of each year the sidereal clock agrees with the mean-time or ordinary clock, and the former gains on the latter 3^m $56^s.555$ of sidereal time per day, so that at the end of a year it will have gained an entire day, and will again agree with the mean-time clock.

Civil Day.—According to the customs of society, the civil day commences at midnight, and comprises twenty-four hours, which extend to the next following midnight. The hours are counted from 0 to 12 in two series; the first, marked A. M., running from midnight to noon, and the second, marked P. M., running from noon to midnight.

Astronomical Day.—The astronomical day begins at noon on the civil day of the same date. It also comprises twenty-four hours, but they are reckoned from 0 to 24, and run from the noon of one day to that of the next following. Astronomical time as well as civil time may be either apparent or mean, according as it is reckoned from apparent noon or from mean noon.

The civil day begins twelve hours before the astronomical day; therefore the first half of the civil day corresponds to the last half of the preceding astronomical day, and the last half of the civil day coincides with the first half of the astronomical day of the same date. Thus, January 9, 2 o'clock, A. M., civil time, is January 8, 14^h, astronomical time; and January 9, 2 o'clock, P. M., civil time, is also January 9, 2^h, astronomical time. Hence, we have the following rules:

To convert Civil Time into Astronomical Time.—If the civil time is marked A. M., take one from the day and add twelve to the hours, and the result will be the corresponding astronomical time; if the civil time is marked P. M., take away the designation P. M., and the astronomical time will result.

To convert Astronomical Time into Civil Time.—If the astronomical time is less than twelve hours, simply write P. M. after it. If greater than twelve hours, subtract twelve hours from it, mark the result A. M., and add one to the days. For example, October 3, 23 hours, astronomical time, is October 4, 11 o'clock, A. M., civil time.

To find Greenwich Time.—Express the longitude from Greenwich in time, and when west, add it to the local time, or when east, subtract it from the local time. The result will be the corresponding Greenwich time; mean or sidereal, according as the local time employed is mean or sidereal. For use with Part I of this Ephemeris, Greenwich mean time is ordinarily required.

PART I—THE EPHEMERIS FOR THE MERIDIAN OF GREENWICH.

Pages 2–217 give data arranged under the heads of the several months, and are therefore designated as the Calendar. Each month covers 18 pages, numbered from I to XVIII, whose contents are as follows:

Page I contains, for Greenwich apparent noon of each day, *The Sun's Apparent Right Ascension* and *Declination*, and the *Equation of Time.* Adjoining columns contain the differences of these quantities for one hour. By multiplying any one of these differences by the hours and parts of an hour from Greenwich apparent noon, and adding the product to, or subtracting it from, the corresponding quantity at noon, according as that quantity is increasing or decreasing, we obtain the value of the quantity in question for any given Greenwich apparent time. The hourly differences are given for the instant of apparent noon at Greenwich, but, when great accuracy is required, they should be interpolated for half the hours and parts of an hour of the Greenwich apparent time.

The *Equation of Time* given on page I is the mean time of apparent noon, or the hour angle of the mean Sun at that instant. The heading of the column directs how the equation is to be applied to apparent time, or the time given by an observation of the Sun, in order to get mean time. When in the course of the month there is a change from addition to subtraction or the reverse (as in the months of April and June), the two different directions are separated by a line, while a corresponding line below points out the dates between which the change occurs.

The Sun's Semidiameter and the *Sidereal Time of Semidiameter Passing Meridian* are also given on page I. The semidiameter is used in reducing the altitude of the upper or lower limb of the Sun to the altitude of the center; and in reducing the angular distance between the limb of the Sun and any other object, to the distance from the center of the Sun. The sidereal time of semidiameter passing the meridian is employed in obtaining the passage of the Sun's center over the wires of a transit instrument, when the passage of one limb only has been observed. The quantity found in this column is to be added to the time of transit of the first, or western, limb; and to be subtracted from the time of transit of the second, or eastern, limb.

This page is chiefly used when the Sun is observed on the meridian, at which instant the local apparent time is $0^h\ 0^m\ 0^s$. The longitude from Greenwich expressed in time is then the corresponding Greenwich apparent time, before or after noon according as the longitude is east or west. The longitude of any place is therefore the factor employed in reducing the quantities on this page to apparent noon at that place.

The right ascension of the Sun thus reduced is the sidereal time of local apparent noon, and the difference between that and the clock time of the meridian passage of the Sun is the error of the clock on sidereal time.

The declination of the Sun reduced to the meridian, or apparent noon, of the place, is required in finding the latitude from a meridian altitude of the Sun.

As an example of the use of page I:—

Let the Sun's declination be required at apparent noon, 1909, July 4, at a place whose longitude is 89° 40′, or $5^h\ 58^m\ 40^s$ east from Greenwich:—

		h	m	s
Local apparent time	July 4,	0	0	0
Longitude from Greenwich (subtractive)		5	58	40
Greenwich apparent time	July 3,	18	1	20

Reducing the minutes and seconds to decimals of an hour, we find that this moment is $18^h.022$ after Greenwich apparent noon on July 3, or $5^h.978$ before Greenwich apparent noon on July 4.

On page 110 of the Ephemeris we find that the change of declination in one hour is:

	″
July 3, at Greenwich apparent noon	— 11.67
July 4, at Greenwich apparent noon	— 12.67
Difference for one day	— 1.00

If great exactness is desired, we find the amount of this hourly difference for the time which is halfway between Greenwich noon and the time of observation; that is, for 9 hours after Greenwich noon of the 3rd, this being half of 18 hours. Nine hours is 0.375 of a day; so the calculation is as follows:

	″
Difference for one hour, July 3	− 11.67
Change for 0.375 of a day or 1″.00 × 0.375	− 0.38
Difference at 9 hours after noon	− 12.05

$12''.05 \times 18.022 = 217''.2 = 3'\ 37''.2$

		°	′	″
Declination at Greenwich noon, July 3	N.	23	0	19.2
Change in 18.022 hours (subtractive)			3	37.2
Sun's declination at time of observation	N.	22	56	42.0

When the time of observation is only a few hours before Greenwich noon, it may be better to count the longitude backward from this nearest noon. Thus, in the example just given, the time is $5^h.978$ before Greenwich noon of July 4; half this interval is about 0.12 of a day, and the hourly motion for the middle of the interval is 12″.55. Then, we find—

		°	′	″
Declination at Greenwich noon, July 4	N.	22	55	27.0
Product of 12″.55 × 5.978 = 75″.0 (additive)			1	15.0
Sun's declination at time of observation	N.	22	56	42.0

It will always be well to make the calculation in both ways, as a check; but if the results differ slightly, the one derived from the nearest noon should be regarded as the more accurate. At sea, however, it is ordinarily sufficient to compute the declination to the nearest half minute, and the reduction may then be found by Table 12 of BOWDITCH's *American Practical Navigator*.

Page II contains, for Greenwich mean noon of each day, *The Sun's Apparent Right Ascension* and *Declination*, the *Equation of Time*, and the *Sidereal Time of Mean Noon*. The hourly changes of these quantities are also given, and may be used in reducing them for the longitude, or to any Greenwich mean time. When great precision is required, these changes should be interpolated for half the Greenwich time, as described in explaining the calculation of the declination.

The *Equation of Time* given on page II is the apparent time of mean noon, and is equivalent to the hour angle of the true Sun at the instant of mean noon. The heading of the column directs how the equation must be applied to mean time in order to obtain apparent time.

The *Sidereal Time of Mean Noon* is the right ascension of the mean Sun at Greenwich mean noon. It may be reduced for the longitude, or to any Greenwich mean time, by using the hourly difference, $9^s.8565$; or by Table III appended to this volume, for reducing intervals of mean solar to sidereal time; or by Table 9 of BOWDITCH's *Navigator*.

The right ascensions and declinations on pages I and II are affected both by aberration and nutation, and therefore denote the *apparent* positions of the *true* Sun. Page I is used for observations which depend upon apparent time, as when the Sun is observed on the meridian; while page II is used when the times have been noted by a clock or chronometer regulated to mean time, as is the case in most observations of the Sun out of the meridian.

The Sun's declination is required whenever that body is observed for the purpose of finding latitude, local time, or azimuth, and the equation of time is needed in finding the apparent time when determining the latitude from observations of the Sun out of the meridian.

The sidereal time of mean noon, or right ascension of the mean Sun, is useful in converting mean time to sidereal time. We first find the Greenwich mean time, then the right ascension of the mean Sun for that time, and this being added to the local astronomical mean time will give the sidereal time.

The sidereal time of mean noon, reduced for the longitude of the place, is also used in converting sidereal time to mean time. Subtracting the reduced value from the given sidereal time gives the interval of sidereal time from noon, and that is converted into the required mean time by subtracting from it the corresponding reduction of a sidereal interval to a mean-time interval, taken from Table II appended to this volume, or from Table 8 of BOWDITCH's *Navigator*. Instead of using Table II, this reduction may be found by multiplying $9^{s}.8296$ by the hours and parts of an hour of the sidereal interval from noon.

As examples of the use of page II:—

1.—Let the Sun's right ascension and the equation of time be required for 1909, July 13, $9^{h}\ 2^{m}\ 30^{s}$, A. M., mean time, at a place whose longitude is 100° 10′, or $6^{h}\ 40^{m}\ 40^{s}$, west of Greenwich.

		h	m	s
Local astronomical mean time . . .	July 12,	21	2	30
Longitude from Greenwich (additive)		6	40	40
Greenwich mean time	July 13,	3	43	$10 = 3^{h}.7194$

Sun's Right Ascension.	h	m	s	*Equation of Time.*	m	s
July 13, Greenwich noon .	7	28	19.57	July 13, Greenwich noon .	5	25.49 (subtractive)
H. D. $10^{s}.164 \times 3.7194$ . .	+		37.80	H. D. $+ 0^{s}.308 \times 3.7194$.	+	1.15
	7	28	57.37		5	26.64

In this case the hourly differences interpolated to half the interval, or $1^{h}.86$ after noon, have been used. The equation of time is here subtractive from mean time. Its reduction could have been found by Table 12 of BOWDITCH's *Navigator*.

2.—If the sidereal time is required for the same date and time, we have—

	h	m	s
July 13, sidereal time (at Greenwich mean noon)	7	22	54.08
Reduction for $3^{h}\ 43^{m}\ 10^{s}$ from Table III, or $9^{s}.8565 \times 3.7194$ . .	+		36.66
Add the local astronomical mean time	21	2	30.00
The required sidereal time is (rejecting 24^{h})	4	26	0.74

The reduction $36^{s}.66$ could have been found in Table III corresponding to the Greenwich mean time $3^{h}\ 43^{m}\ 10^{s}$, or by Table 9 of BOWDITCH's *Navigator*.

3.—On 1909, July 13, A. M., at a place whose longitude is 100° 10′ W., suppose the sidereal time to be $4^{h}\ 26^{m}\ 0^{s}.74$, and that the corresponding mean time is required.

The astronomical day is July 12; the longitude in time, $+ 6^{h}\ 40^{m}\ 40^{s}$, or $+ 6^{h}.678$.

		h	m	s
July 12, sidereal time (at Greenwich mean noon)		7	18	57.53
Reduction for $6^{h}\ 40^{m}\ 40^{s}$ from Table III, or $9^{s}.8565 \times 6.678$ . . .		+	1	5.82
The sidereal time of local mean noon		7	20	3.35
The given sidereal time ($+ 24^{h}$, if necessary for the following subtraction) .		28	26	0.74
Subtracting the first from the second gives the sidereal interval from noon .		21	5	$57.39 = 21^{h}.0993$
Reduction for $21^{h}\ 5^{m}\ 57^{s}.39$ from Table II, or $- 9^{s}.8296 \times 21.0993$ . .		—	3	27.40
The required astronomical mean time is . . .	July 12,	21	2	29.99

Page III contains, for Greenwich mean noon of each day, *The Sun's True Longitude* and *Latitude*, and the *Logarithm of the Radius Vector of the Earth*. The longitudes of the Sun are the true geometric longitudes, not corrected for aberration. They are given in two columns, headed respectively λ and λ'; λ representing the Sun's longitude counted from the true equinox of the date; and λ', the same co-ordinate counted from the mean equinox of the beginning of the Besselian fictitious year. The latitude is referred to the mean ecliptic of the date. Columns of hourly differences are given to facilitate finding the Sun's longitude, or the logarithm of the radius vector, for any hour from noon.

The last column on page III contains the *Mean Time of Sidereal Noon;* that is, the number of hours, minutes, and seconds after Greenwich mean noon when the vernal equinox passes the meridian of Greenwich. It may be reduced to any meridian, or to any Greenwich sidereal time, by using the hourly difference, $-9^{s}.8296$, to effect the necessary interpolation. The reduction, however, can be taken directly from Table II for reducing intervals of sidereal time to mean solar time, or from Table 8 of BOWDITCH's *Navigator.*

This column may be used in converting sidereal time to mean time, instead of that on page II. As an illustration, let us take Example 3, above.

It is seen in advance that the sum of the mean time of sidereal noon and the given sidereal time is less than 24 hours. Were it more than 24 hours, the mean time of sidereal noon should be taken out for July 11; that is, the preceding astronomical day.

	h	m	s	
July 12, the mean time of Greenwich sidereal noon is	16	38	18.48	
Reduction for longitude from Table II, or $- 9^s.8296 \times 6.678$	—	1	5.64	
The mean time of local sidereal noon	16	37	12.84	
Add the given sidereal time	4	26	0.74	$= 4^h.4335$
The sum is	21	3	13.58	
Reduction for $4^h\ 26^m\ 0^s.74$ from Table II, or $- 9^s.8296 \times 4.4335$		—	43.58	
The required astronomical mean time . . . July 12,	21	2	30.00	

Page IV contains *The Moon's Semidiameter* and *Equatorial Horizontal Parallax,* for each mean noon and midnight at Greenwich. Columns adjoining those of the horizontal parallax give the change of that quantity in one hour, by means of which it can be reduced to any other Greenwich mean time, in the same way as the Sun's declination and the equation of time in the preceding examples. The sign plus or minus is prefixed to the hourly differences, according as the horizontal parallax is increasing or decreasing.

The reduction of the Moon's semidiameter may be readily found by multiplying the reduction of the horizontal parallax by 0.273, or by simply computing the proportional part.

If, for example, the semidiameter of the Moon is to be taken out for 1909, March 10, 7^h, P. M., Greenwich mean time, we see that the difference of the semidiameters at noon and midnight of March 10 is $2''.8$; then,

$$12^h \ : \ 7^h \ = \ 2''.8 \ : \ 1''.6,$$

which is the correction to be added to the semidiameter at noon, because the semidiameter is increasing. The Moon's semidiameter for March 10, 7^h, is therefore $14'\ 52''.4$.

The Moon's semidiameter and horizontal parallax are required for all observations of the Moon. When great precision is needed, the hourly differences should be interpolated for half the interval of Greenwich time from noon or midnight, and the horizontal parallax should be corrected for the latitude of the place of observation.

The *Mean Time of the Moon's Upper Transit at Greenwich* and the *Age of the Moon* are also contained on page IV. The time of transit is given to tenths of a minute, and is accompanied by a column of differences for one hour of longitude, by means of which the local time of the Moon's meridian transit may be computed for any other place whose longitude is known. Table 11 of BOWDITCH's *Navigator* furnishes the necessary reduction by simple inspection. The age of the Moon, or the time elapsed since the preceding new Moon, is given to tenths of a day.

Pages V–XII contain *The Moon's Right Ascension* and *Declination* for each day and hour of Greenwich mean time. They are accompanied by columns of differences for one minute, which are also given at each hour. The Greenwich mean time, which is required for taking out these quantities, may either be taken from a well-regulated chronometer, or may be obtained by applying the longitude, converted into time, to the local mean time of the observer. The right ascension or declination is taken out for the given day and hour of Greenwich mean time; the *Diff. for 1 Minute* is multiplied by the minutes and parts of a minute of the Greenwich time, and the product is added to or subtracted from the quantity, according as the latter is increasing or decreasing.

Thus, suppose the Moon's right ascension and declination are required for 1909, June 20, $10^h\ 10^m\ 30^s$, astronomical mean time at Greenwich:—

	Right Ascension. h m s		Declination. ° ′ ″
June 20, 10^h . . .	8 31 18.47	. . . . .	N. 22 56 34.6
Diff. 2.2468 × 10.5 . .	23.59	−5.837 × 10.5	− 1 1.3
June 20, $10^h\ 10^m\ 30^s$ . .	8 31 42.06	. . . . .	N. 22 55 33.3

For the sake of precision, the differences here employed have been interpolated for $5^m.2 = 0^h.09$.

Page XII contains also the *Phases of the Moon* and the dates of the *Moon's Perigee and Apogee*, or least and greatest distances from the Earth.

Pages XIII–XVIII contain the *Lunar Distances*, or the angular distances of the center of the Moon from the center of the Sun, from the centers of the four brighter planets, and from certain fixed stars, as they would appear to an observer at the center of the Earth. They are given for every third hour of Greenwich mean time, and as the reckoning begins at noon, the dates are astronomical. All the distances which can be observed on the same day are grouped together under that date, and the columns are read from left to right, across both pages of the same opening. The letter W. or E. is affixed to the name of the Sun, planet, or star, to indicate whether it is on the west or east side of the Moon.

An observer on the Earth's surface by measuring a lunar distance, correcting it for errors of his instrument and for the semidiameters of the objects, and clearing it from the effects of refraction and parallax, finds the true or geocentric distance; that is, the distance as it would have appeared from the center of the Earth at the moment of observation. By comparing this distance with the corresponding distances given in the Ephemeris, the Greenwich mean time of the observation can be derived.

To lessen the labor of computation, the Ephemeris contains, between every two successive distances, the logarithm of the seconds of time in which the distance changes one second of arc; or, as it is usually called, the *Proportional Logarithm of the Difference.* It is given for the middle instant of the two hours between which it is placed.

For computing the Greenwich time corresponding to a given lunar distance we have the following rule:

Find in the Ephemeris the two distances between which the true distance falls; take out the nearer of these, the hours of Greenwich time over it, and the P. L. of Diff. between them.

Find the difference between the true distance and the distance taken from the Ephemeris; and from the proportional logarithm of this difference, as found in Table 45 of BOWDITCH'S *Navigator, subtract the P. L. of Diff. taken from the Ephemeris.*

The result will be the proportional logarithm of an interval of time to be added to the hours of Greenwich time, taken from the Ephemeris, when the earlier Ephemeris distance is used; or to be subtracted from the hours of Greenwich time, when the later Ephemeris distance is used.

Another method is to add the common logarithm of the difference in seconds between the true and the Ephemeris distances to the P. L. of Diff. of the Ephemeris; and then the sum will be the common logarithm of the correction to be applied to the hours of Greenwich time. Table 34 of BOWDITCH'S *Navigator* saves the operation of reducing degrees (or hours) and minutes to seconds, and the reverse.

As the P. L. of Diff. in the Ephemeris varies continually, the Greenwich time found by the methods just described may not be sufficiently exact. To correct it for such variation, or second difference, take the difference between the P. L. of Diff. used and the one which follows it in the Ephemeris (or, more strictly, half the difference of the preceding and following ones). With this difference, and the first correction of the Greenwich time already found, enter Table I, appended to this volume, and take out the corresponding seconds, which are to be added to the approximate Greenwich time when the Prop. Logs. in the Ephemeris are decreasing, or subtracted when they are increasing.

Thus the Greenwich mean time of an observation can be ascertained, and if the observer has noted the time of observation by a chronometer, the difference between this chronometer time and the Greenwich mean time will be the error of the chronometer on Greenwich time as found from the lunar distance. In that way lunar distances can be used as a check upon the chronometer, and by a series of them carefully observed on both sides of the Moon, the chronometer error may generally be determined within 20 or 30 seconds.

If the observer has found the local mean time of observation from the observed altitude of one of the bodies, or by a watch regulated to that time by recent observations and corrected for change of longitude in the interval, the difference of this local time and the Greenwich time found from the lunar distance will be his longitude. A longitude derived by this method should always be considered as uncertain by 5′ or more.

As an example of finding the Greenwich mean time from a lunar distance, suppose that in 1909, January 12, the corrected distance of the Moon's center from Regulus is 36° 20′ 0″—

	°	′	″		
Corrected distance	36	20	0		
Distance in Ephemeris Jan. 12 XV hours	36	3	19	P. L.	0.3092
Difference		16	41	P. L.	1.0330
				P. L.	0.7238
	h	m	s		
Time from XV hours (*after*)	0	34	0		
Corr. for 2d Diff., Table I		+	1		
Greenwich mean time Jan. 12	15	34	1		

By a table of common logarithms, or a table of logarithms of small arcs, the reduction of the Greenwich time would be found thus:

From Ephemeris,	P. L.	0.3092
Diff. of distances, 16′ 41″ = 1001″	log	3.0004
Red. of Greenwich time, $2040^s = 0^h\ 34^m\ 0^s$	log	3.3096

The result is the same as by the previous method.

Pages 218–249 contain the geocentric ephemerides of the seven major planets. The places given are apparent positions; that is, they are referred to the equator and true equinox of the date, and are corrected for aberration. All the data except meridian passage are given for the instant of Greenwich mean noon. The column *Meridian Passage* shows the hour, minute, and tenth of that passage of the planet over the meridian of Greenwich which occurs next after the noon of the date.

The right ascension and declination of a planet are required whenever it is observed for time, latitude, or azimuth. The mode of reducing the ephemeris positions of planets to other instants of Greenwich mean time is the same as that given for the Sun on pages 563–566. The local mean time of meridian passage of any planet, at any place, can be found by dividing the proper daily difference of the ephemeris times by 24, multiplying the quotient by the longitude of the place expressed in hours and fractions, and applying the product with its proper sign to the time of Greenwich passage.

Pages 250–271 contain the heliocentric co-ordinates of the seven major planets, and the logarithms of their distances from the Earth. The heliocentric longitude is reckoned, not from the true equinox, as in the preceding ephemerides, but from the mean equinox of the date. It is, therefore, necessary to apply nutation, if the longitude from the true equinox is required. The daily motion is given for the instant of Greenwich mean noon. The column *Reduction to Orbit* contains the correction to be applied to the heliocentric longitude in order to obtain the longitude counted along the orbit of the planet. The latter is equal to the distance from the mean equinox to the node, plus the distance from the node to the planet. The heliocentric latitude is counted from the mean ecliptic of the date.

The *Logarithm of Radius Vector* is the logarithm of the distance of the center of the planet from that of the Sun, at the Greenwich mean noon whose date is given in the first column. The last two columns give, respectively, the logarithm of the true distance of the center of the planet from that of the Earth, for the Greenwich noon indicated on the left-hand side of the page, and for the time which is midway between that date and the date next below it. In the case of Mercury, this intermediate date is mean midnight of the same day; in the case of Venus and Mars, it is the mean noon of the day immediately following; in the case of Jupiter and Saturn, it is mean noon of the second day following; and in the case of Uranus and Neptune, mean noon of the fourth day following.

Pages 272–279 contain the rectangular co-ordinates of the center of the Sun, referred to the center of the Earth as the origin, and to the true equator and equinox of each date as the plane and point of reference. Each co-ordinate is given both for Greenwich mean noon, and for Greenwich mean midnight of the same day. The columns *Reduc. to Mean Eq'x of Jan.* 0 give the corrections to be applied to the co-ordinates for noon in order to obtain the corresponding co-ordinates referred to the mean equator and the mean equinox of the beginning of the Besselian fictitious year.

Pages 280–283 give for every Greenwich mean noon and midnight the apparent geocentric longitude and latitude of the Moon referred to the true ecliptic and equinox of the date.

Page 284 contains the position of the Moon's equator, the longitude of the Moon's perigee, the mean longitude of the Moon's ascending node, and the Moon's mean longitude.

Page 285 contains the elements of the libration of the Moon, and the Sun's aberration and horizontal parallax. The epochs of greatest libration of the Moon, together with the formulæ for finding the libration in longitude and latitude, are given on page 440. *The Sun's Aberration* is the quantity which is to be applied to the true longitude of the Sun in order to obtain its apparent longitude. The correction being negative shows that the apparent longitude as affected by aberration is always less than the true longitude. The *Sun's Equatorial Horizontal Parallax*, given in the last column, is the angle subtended by the equatorial radius of the Earth, as seen from the center of the Sun.

Pages 286–288 give data for precession and the obliquity of the ecliptic, together with all sensible terms arising from the motions of the equator and ecliptic. To show clearly the relations of these quantities, let

λ = the longitude of any body referred to the true equinox of the date.

λ' = the longitude of the same body referred to the mean equinox of the beginning of the Besselian fictitious year.

ψ_1 = the adopted value of the general precession.

$\delta'\psi$ = the principal term of the nutation in longitude; or, in other words, the correction to be applied to the longitude of a body referred to the mean equinox of date, in order to obtain that longitude as referred to the true equinox, exclusive of short period terms. When the correction is positive, the longitudes referred to the true equinox are greater than those referred to the mean equinox; while the contrary is the case when the correction has a negative sign.

$\delta''\psi$ = the short period terms of nutation in longitude, given on pages 287–288.

ω = the true or apparent obliquity of the ecliptic at the date.

ω' = the mean obliquity of the ecliptic at the beginning of the Besselian fictitious year.

$\delta'\omega$ = the principal term of the nutation of the obliquity of the ecliptic; or, in other words, the correction to be applied to the mean obliquity of date in order to find the true or apparent obliquity, exclusive of short period terms. This quantity is tabulated on page 286, and is positive or negative according as the true obliquity is greater or less than the mean obliquity.

$\delta''\omega$ = the short period terms of nutation in obliquity, given on pages 287–288.

τ = the fraction of a year intervening between the instant when the Sun's mean longitude was 280° and the date for which λ or ω is required.

Then

$$\lambda = \lambda' + \tau\psi_1 + \delta'\psi + \delta''\psi$$

$$\omega = \omega' - 0''.464\tau + \delta'\omega + \delta''\omega$$

Page 286 contains, for each fifth Greenwich mean noon throughout the year, certain quantities which may be described in terms of the above notation as follows: The *Precession in Longitude from 1909.0* = $\tau\psi_1$; the *Nutation in Longitude* = $\delta'\psi$; the *Nutation in Right Ascension* = $(\delta'\psi)\cos\omega'$; the *Nutation in Obliquity* = $\delta'\omega$, and the *Obliquity of the Ecliptic* = $\omega - \delta''\omega$, which is the true inclination of the Earth's equator to the ecliptic, exclusive of the terms depending on the Moon's longitude.

Pages 287–288 contain the values of $\delta''\psi$ and $\delta''\omega$, which are not included in the values of nutation given on page 286.

PART II—THE EPHEMERIS FOR THE MERIDIAN OF WASHINGTON.

Page 290 contains formulæ for reducing the positions of fixed stars, including expressions for the Besselian star-numbers and star-constants, and for the independent star-numbers; the whole based upon the constants of Struve and Peters, and expressed in the notation of Bessel.

Pages 291–294 contain the logarithms of the *Besselian Star-Numbers, A, B, C, D,* for each Washington mean midnight, with the values of *E* appended at the bottoms of the pages. These numbers serve to reduce the mean place of a star at the beginning of the Besselian fictitious year to its apparent place at the dates for which the numbers are given, and in ordinary cases four-figure logarithms suffice; but where extreme accuracy is desired the logarithms of *A, C,* and *D* are sometimes needed to five places of decimals. If used in accordance with the English and French notation, the pair of quantities *A* and *B* must be interchanged with the pair *C* and *D;* that is, *A* must be interchanged with *C,* and *B* with *D.* Along with the solar day, the first column contains the sidereal hour of Washington mean midnight for certain dates, and by interpolation among them it is easy to find the sidereal time for which any set of quantities is given.

The following is an example of the reduction of a star to apparent place by the Besselian star-numbers:—

Computation of the apparent place of 26 Aurigæ for May 26, 1909, for the upper transit at Washington.

log a	0.5858	log b	7.6665	log c	7.9618	log d	8.8852
log A	8.7245	log B	0.2537 *n*	log C	0.9018 *n*	log D	1.2673 *n*
log a'	0.3756	log b'	9.9969 *n*	log c'	9.1107 *n*	log d'	8.7782
log Aa	9.3103	log Bb	7.9202 *n*	log Cc	8.8636 *n*	log Dd	0.1525 *n*
log Aa'	9.1001	log Bb'	0.2506	log Cc'	0.0125	log Dd'	0.0455 *n*

		h m s		° ′ ″
Mean Place, 1909.0,	α_0 =	5 32 47.447	δ_0 =	+ 30 26 20.60
	Aa =	+ 0.204	Aa' =	+ 0.13
	Bb =	− 0.008	Bb' =	+ 1.78
	Cc =	− 0.073	Cc' =	+ 1.03
	Dd =	− 1.421	Dd' =	− 1.11
	E =	− 0.003	$\tau\mu'$ =	− 0.01
	$\tau\mu$ =	± 0.000		
Apparent Place, May 26,	α =	5 32 46.146	δ =	+ 30 26 22.42

Pages 295–302 contain the *Independent Star-Numbers,* which can frequently be advantageously used instead of the *Besselian Star-Numbers.* These quantities are connected with those of Bessel by the relations given on page 290, which also contains the formulæ and precepts for the application of both systems of numbers. In order to use the Besselian numbers, it is necessary to have the values of the star-constants, *a, b, c, d, a′, b′, c′, d′,* while the independent star-numbers render it possible to determine the apparent place of a star without computing these star-constants. Four-figure logarithms usually suffice, but

where extreme accuracy is desired the logarithms of g and h are needed to five places of decimals, and G and H are needed to one-tenth of a minute of arc. The column τ gives the fraction of a year, counted from the beginning of the Besselian fictitious year to each date.

The following is an example of the reduction of a star to apparent place by the independent star-numbers:—

Computation of the apparent place of 26 Aurigæ for 1909, May 26, for the upper transit at Washington.

	h m				° ′
$G =$	20 2.6			$\delta_0 =$	+ 30 26.3
					h m
$\alpha_0 =$	5 32.8			$G + \alpha_0 =$	1 35.4
$H =$	13 33.3			$H + \alpha_0 =$	19 6.1
					h m s
$\log \frac{1}{15}$	8.8239	$\log \frac{1}{15}$	8.8239	$\alpha_0 =$	5 32 47.447
$\log g$	0.3191	$\log h$	1.3043	$f =$	+ 0.160
$\sin (G + \alpha)$	9.6068	$\sin (H + \alpha)$	9.9817 n	$(g) =$	+ 0.033
$\tan \delta$	9.7691	$\sec \delta$	0.0644	$(h) =$	− 1.494
$\log (g)$	8.5189	$\log (h)$	0.1743 n	$\tau \mu$	± 0.000
				$\alpha =$	5 32 46.146
					° ′ ″
$\log g$	0.3191	$\log h$	1.3043	$\delta_0 =$	+ 30 26 20.60
$\cos (G + \alpha)$	9.9612	$\cos (H + \alpha)$	9.4540	$(g') =$	+ 1.91
$\log (g')$	0.2803	$\sin \delta$	9.7047	$(h') =$	+ 2.90
		$\log (h')$	0.4630	$(i) =$	− 2.98
				$\tau \mu' =$	− 0.01
				$\delta =$	+ 30 26 22.42
$\log i$	0.5391 n				
$\cos \delta$	9.9356				
$\log (i)$	0.4747 n				

Page 303 contains for every tenth sidereal day the *Besselian* and *Independent Star-Numbers*, exclusive of all short period terms. They are useful in computing ephemerides of stars, similar to those on pages 324–399, for which constants containing short period terms should not be employed.

Pages 304–311 contain the mean places of three hundred and eighty-three stars, for the beginning of the Besselian fictitious year 1909, or, in other words, for the moment when the Sun's mean longitude is 280°. The annual variations are to be considered as the differential coefficients of each co-ordinate with respect to the time at the beginning of the year.

Pages 312–323 contain the apparent positions of the five circumpolar stars, *α*, 6 B., *δ* and *λ* Ursæ Minoris, and 51 Cephei, for every upper transit at Washington. The mean solar time of transit is given in the column *Mean Solar Date*, in order that each transit above and below the pole may be readily identified. Suppose, for example, that the transit of Polaris below the pole on January 26 is to be found, and we wish to know whether it precedes or follows the upper transit of the same date. On page 312, we find that the upper transit occurs January 26.2; the lower transit, therefore, occurs January 26.7. But the lower transit following that of July 1 (page 318) does not take place until July 2.3. Hence, the lower transit of July 1 precedes the upper one of the same date. A transit occurring very nearly at noon may also be identified without a computation to ascertain the actual mean date, by simply noting the tenth of a day in the column *Mean Solar Date*.

Pages 324–399 contain, for every tenth upper transit at Washington, the apparent places of 378 stars, being all those given in the list of mean places, except the five circumpolars. The mean solar date in the left-hand column of each page gives the day and tenth of the transit, so that intermediate transits may be readily identified; and to facilitate interpolation, the differences of each co-ordinate are given for every ten days.

Pages 400–407 contain the apparent right ascension and declination of the Sun, both for Washington mean and apparent noon, and the hourly motion of the Sun in these co-ordinates; the equation of time, the semidiameter of the Sun, and the sidereal time of semidiameter passing the meridian, for Washington apparent noon; and lastly, the sidereal time of mean noon. The hours and minutes of right ascension and the degrees and minutes of declination are always made the same for both mean and apparent noon. In cases where they really differ, the minute which would have been numerically larger is diminished by one, and the seconds increased by sixty, so that the sum of the two remains correct. The hourly motions in right ascension and declination are given for the columns headed *Mean Noon*, but may be regarded as having the same values for apparent noon.

The *Equation of Time for Apparent Noon* is the correction to be applied to apparent time in order to obtain mean time. It is, therefore, mean time minus apparent time. Each number as given is the mean time of transit of the Sun's center over the meridian of Washington, counted from the nearest noon. The use of all the quantities is substantially the same as in the *Ephemeris for the Meridian of Greenwich.*

Pages 408–415 contain the right ascension, declination, semidiameter, and parallax of the Moon, at the moment of transit over the meridian of Washington. The mean time given in the second column is that of transit of the Moon's center over this meridian. The differences for one hour of longitude are the amounts by which the local mean times of transit over a meridian one hour west of Washington would exceed those given in the column *Mean Time of Transit*, supposing the rate of change to be uniform and equal to what it is at the instant of transit over the meridian of Washington. The next four columns need no especial explanation, except that the differences for one hour of longitude are computed as if the motion of the Moon in right ascension were uniform, or, in other words, they are differential coefficients corresponding to the instants of Washington transit. By means of them, when second differences are taken into account, the position of the Moon can be computed with great exactness for the moment of transit over any meridian not more than one hour distant from Washington. To obtain the same accuracy for more distant meridians, we may proceed as follows: Let F represent either the *Mean Time of Transit*, the *Right Ascension of Center*, or the *Geocentric Declination of Center*, and let D represent the corresponding *Difference for One Hour of Longitude.* Write down three successive values of F, together with the corresponding values of D, and difference the latter as in the following scheme; where the middle values, F_0 and D_0, belong to the Washington culmination from which is to be derived the value of F for the culmination on the meridian whose longitude is λ :—

Function.	Diff. for 1 Hour of Longitude.	Δ'	Δ''
F_{-1}	D_{-1}		
		a'	
F_0	D_0		b
		a''	
F_{+1}	D_{+1}		

Then, for the culmination at the meridian λ

$$F_\lambda = F_0 + \lambda D_0 + \frac{\lambda^2}{96}(a' + a'') + \frac{\lambda^3 b}{3456}$$

where λ must be expressed in hours and decimals of an hour, and is to be taken plus or minus according as the longitude from Washington is west or east.

The columns of *Sidereal Time of Semidiameter passing Meridian*, *Geocentric Semidiameter* and *Equatorial Horizontal Parallax* do not seem to need any explanation, except that they all refer to the moment of transit. The column *Bright Limbs* is given to indicate to the observer which limbs are illuminated. When one limb is full and the terminator is within 0″.05 of the opposite limb, both can be well observed, and in such cases both are indicated.

Pages 416–433 contain the geocentric apparent right ascensions and declinations of the seven major planets, together with their horizontal parallaxes, semidiameters, and sidereal times of semidiameters passing the meridian, for the moments of all transits which it is usually desirable to observe over the meridian of Washington. The columns following the dates give the Washington mean times of these transits.

PART III—PHENOMENA.

This part gives the dates of the principal astronomical phenomena of the year, expressed in Washington mean time, except in the case of the eclipses, which are expressed in Greenwich mean time.

Pages 436–439 contain all necessary data respecting the solar and lunar eclipses which occur during the year.

The eclipse elements are given for the moment of conjunction of the Sun and Moon in right ascension, but the subsequent tables and results are computed from the exact positions of these bodies at the several instants referred to. The times and angles designated as the circumstances of a lunar eclipse remain the same throughout all parts of the Earth, and require no explanation beyond a mere statement of the fact that in computing them the geometrical diameter of the Earth's shadow has been augmented in the proportion of 51 : 50. The principal circumstances of each total and annular solar eclipse are stated on five lines, as follows:—

The line entitled "Eclipse begins" gives the Greenwich mean time at which the Moon's penumbra first touches the Earth, together with the latitude and longitude of the point of contact.

The line entitled "Central eclipse begins" gives the time when the axis of the Moon's shadow first touches the Earth, and the latitude and longitude of the point of contact follow.

The line entitled "Central eclipse at noon" gives the time when the axes of the Earth and of the shadow cone lie in the same plane. The latitude and longitude of the point where the axis of the shadow cone then cuts the Earth's surface follow, and there the eclipse will be central and the Sun will be exactly on the meridian.

The lines entitled "Central eclipse ends" and "Eclipse ends" give, respectively, the times when and the localities where these events occur, the phenomena being the converse of those denoted by the similar phrases for the beginning.

In the case of partial solar eclipses the axis of the Moon's shadow does not come into contact with the Earth, and the three lines entitled, respectively, "Central eclipse begins," "Central eclipse at noon," and "Central eclipse ends," are replaced by a single line entitled "Greatest eclipse," whereon are given the time when and the latitude and longitude where the eclipse attains its greatest magnitude. The latter phenomenon necessarily occurs with the Sun in the horizon.

Maps of the Eclipses.—The regions in which each eclipse is visible are shown upon the map relating to it, from which may be taken approximately, for any place, both the times of the beginning and ending of the eclipse and its magnitude. The dotted curves show the outline of the shadow for each hour of Greenwich mean time, and therefore pass through all places where the eclipse begins or ends at the hour indicated. To find the instant of beginning at any place, we determine by inspection between what pair of these curved lines the place is situated. The eclipse will then begin between the corresponding hours of Greenwich mean time; and the fraction of the hour may be determined by dividing the hour in the same proportion as the space representing it on the map is divided by the place in question. This division may be made a little more exact by allowing for the changes in the spaces as indicated by their varying width. The Greenwich mean time thus found must be reduced to local mean time by applying the longitude.

As an example, suppose we wish to find the times at which the eclipse of 1909, June 17, begins and ends at the place whose latitude is 60° N. and whose longitude is 160° W.

For the beginning we compare the distance of the place from the curves of 10^h and 11^h, and find it to correspond to about 38 minutes from the former, thus giving for the approximate time of beginning $10^h\ 38^m$; for the end we compare the distance of the place from the curves of 12^h and 13^h, and find it to be about 41 minutes from the former, thus giving for the approximate time of ending $12^h\ 41^m$, and both of these results are probably correct to within 3 or 4 minutes. Changing to local mean time, we shall have—

	Beginning.	*Ending.*
	d h m	d h m
Greenwich mean time	June 17 10 38	17 12 41
Longitude west	10 40	10 40
Local mean time	June 16 23 58	17 2 1

In the case of total and annular eclipses, a fair estimate of the magnitude of the eclipse at any place may be obtained from the position thereof relatively to the central line and to the limit. On the central line, the eclipse is annular or total, while between the central line and the limit the maximum magnitude of the eclipse is given by the quotient of the distance of the place from the limit divided by the distance of the central line from the limit; the measurements being made upon a line drawn through the place, perpendicularly to the central line.

More Accurate Computations.—A more accurate determination of the phases, as visible at any point of the Earth's surface, may be obtained from the Besselian elements which are given for every 10 minutes of Greenwich mean time. Their geometric signification is as follows:—

Let us imagine a plane passing through the center of the Earth, perpendicular to the right line joining the centers of the Sun and Moon. This latter line is the axis of the Moon's shadow, and the plane is called the *fundamental plane* or plane of xy. We take the intersection of this plane with that of the Earth's equator as the axis of x, and the center of the Earth as the origin of co-ordinates. The axis of y is perpendicular to that of x, and directed toward the north; x and y are then the co-ordinates of the point in which the axis of the shadow intersects the fundamental plane, and they are here expressed in terms of the Earth's equatorial radius as unity. The angle d, of which the sine and cosine are both given, is the declination of that point of the celestial sphere toward which the axis of the shadow is directed; or, in other words, it is the declination of the center of the Sun as seen from the center of the Moon. The angle μ is the Greenwich hour angle of this same point of the celestial sphere.

The quantities l_1 and l_2 are the radii of the shadow cones upon the fundamental plane, l_1 corresponding to the penumbra, and l_2 to the umbra, or annulus. The notation is that of CHAUVENET'S *Spherical and Practical Astronomy*, in which l_2 is regarded as positive for an annular, and negative for a total eclipse.

The angles f_1 and f_2, the tangents of which are given, are the angles which the elements of the respective shadow cones make with the axis of the shadow; or, they are the semi-angles of the two cones.

In order to facilitate interpolation to any required moment, the logarithms of x', y', and μ', which are the changes of x, y, and μ, in one minute of time, are given at the bottom of the table.

The method of computing an eclipse from its Besselian elements is based on the fact that at the moments of beginning and ending the distance of the observer from the axis of the shadow or penumbra is equal to the radius of the latter at the point of observation To find this distance and radius we proceed as follows :—

(1) The co-ordinates of the observer, ξ, η, and ζ, together with their variations in one minute, are computed for some assumed moment of Greenwich mean time, as near as practicable to the true time of the required phase.

(2) The co-ordinates x and y of the axis of the shadow, together with their variations in one minute, are taken for the same moment from the tables of elements.

(3) From (1) and (2) the position and motion of the observer relative to the axis of the shadow are found.

(4) The radius of the penumbra or umbra at a distance from the fundamental plane equal to that of the observer is also computed.

(5) Then, assuming the motions to be uniform, we determine the time required for the observer to be brought to a distance from the axis of the shadow equal to this radius.

The formulæ and directions for the several steps in the computation are as follows:—

(1) Find $\rho \cos \varphi'$ and $\rho \sin \varphi'$, which are the geocentric co-ordinates of the station referred to the Earth's equator, ρ being the distance from the center of the Earth, and φ' the geocentric latitude. These co-ordinates may be obtained from geodetic tables, or may be computed from the following table based on CLARKE's spheroid of 1866, by the formulæ—

$$\rho \cos \varphi' = F \cos \varphi$$

$$\rho \sin \varphi' = \frac{\sin \varphi}{G}$$

φ being, as usual, the geographic latitude.

Table for Computing the Geocentric Co-ordinates of a Place.

φ	Log F.		Log G.	
0°	0.00000		0.00295	
5	0.00001	1	0.00294	1
10	0.00004	3	0.00291	3
15	0.00010	6	0.00285	6
20	0.00017	7	0.00278	7
25	0.00026	9	0.00269	9
30	0.00037	11	0.00258	11
35	0.00048	11	0.00247	11
40	0.00061	13	0.00234	13
45	0.00074	13	0.00221	13
50	0.00086	12	0.00209	12
55	0.00099	13	0.00196	13
60	0.00111	12	0.00184	12
65	0.00121	10	0.00174	10
70	0.00130	9	0.00165	9
75	0.00138	8	0.00157	8
80	0.00143	5	0.00152	5
85	0.00146	3	0.00149	3
90	0.00147	1	0.00147	2

For the assumed Greenwich mean time of computation, take from the table of elements the values of $\sin d$, $\cos d$, and μ. Then, with λ for the longitude west from Greenwich, the co-ordinates of the observer will be—

$$\xi = \rho \cos \varphi' \sin (\mu - \lambda)$$

$$\eta = \rho \sin \varphi' \cos d - \rho \cos \varphi' \sin d \cos (\mu - \lambda) = \eta_1 - \eta_2$$

$$\zeta = \rho \sin \varphi' \sin d + \rho \cos \varphi' \cos d \cos (\mu - \lambda) = \zeta_1 + \zeta_2$$

and their variations in one minute of mean time will be—

$$\xi' = [7.63992] \, \rho \cos \varphi' \cos (\mu - \lambda)$$

$$\eta' = [7.63992] \, \rho \cos \varphi' \sin d \sin (\mu - \lambda) = [7.63992] \, \xi \sin d$$

ζ' is not needed.

(2) For the same assumed moment of Greenwich mean time, take from the tables of elements the co-ordinates x and y of the axis of the shadow, together with their variations for one minute, which are equal to one-tenth of the differences of two consecutive numbers. These variations are represented by x' and y', and their logarithms are given beneath the tables of x and y.

(3) The distance m and position-angle M of the axis of the shadow relatively to the observer, and the relative motions, n and N, are computed by the formulæ—

$$\begin{aligned} m \sin M &= x - \xi \\ m \cos M &= y - \eta \\ n \sin N &= x' - \xi' \\ n \cos N &= y' - \eta' \end{aligned}$$

(4) Both for the shadow and for the penumbra, the radius L at the distance ζ from the fundamental plane is computed by the formula—

$$L = l - \zeta \tan f$$

l and f being found from the table of elements, and ζ computed in (1).

(5) If the time chosen for computation is exactly that of the beginning or ending of the eclipse, we shall have—

$$m = L$$

But, as this condition will rarely be fulfilled on a first trial, a correction τ to the assumed time is computed thus: Find the angle ψ from the equation,

$$\sin \psi = \frac{m \sin (M - N)}{L}$$

There will be two values for this angle, of which one will be in the first and the other in the second quadrant when $\sin \psi$ is positive, and one in the third and the other in the fourth quadrant when $\sin \psi$ is negative; but simplicity will be gained by taking only that value of ψ for which $\cos \psi$ is positive. This value lies between the limits +90° and −90°. The correction τ to the assumed time of beginning or ending of the eclipse will then be found, in minutes, from—

$$\tau = -\frac{m \cos (M - N)}{n} \mp \frac{L \cos \psi}{n}$$

where the double sign is to be taken negative for the beginning and positive for the ending.

However, one such pair of values of τ can not give the times of both beginning and ending with accuracy. To attain that, we must commence the computation by assuming two times, one near the beginning, and the other near the ending of the eclipse; both of which may be derived from the chart with sufficient exactness. The computation for the first assumed time will give a small value of τ which, when applied to the assumed time, will give the beginning of the eclipse nearly correctly, and a large value which will give an inaccurate time of ending. Similarly the computation for the second assumed time will give a small and nearly correct value of τ, for finding the time of ending, and a large and inaccurate negative value for finding the time of beginning. We shall thus deduce two times of each phase, only one of which is to be regarded as approximately correct.

The more accurate times of beginning and ending may now be taken in place of those originally assumed, and the whole computation may be repeated, thus leading to a pair of values of τ, which should be very small and accurate. Such a repetition of the computation will in general be advisable, to guard against accidental numerical errors, but a second approximation may be obtained without it, by finding a corrected value of τ in accordance with the formulæ—

$$\delta\tau = \mp \frac{\tau\,(l' + [5.3100]\,\xi \cos d)}{n \cos \psi} - \frac{[4.9788]\,\tau^2}{n \cos \psi}[\xi \sin (N \mp \psi) - \eta_1 \cos (N \mp \psi)]$$

$$\tau_0 = \tau + \delta\tau$$

where the double signs are to be taken negative for the beginning of the eclipse and positive for the ending. l' is the variation of l for one minute of time, and its numerical value can be taken by inspection from the table of Besselian elements.

If the resulting values of τ_0 are not greater than fifteen minutes, the corrected times of contact thus obtained will be theoretically exact within less than a second, but the uncertainties of the solar and lunar tables are such that an unavoidable error of several seconds may exist in the prediction. To guard against numerical mistakes it is better, after making this final correction, to repeat the computations so far as to obtain new values of m and L for the corrected times. If these two quantities agree within a unit of the fourth place of decimals, the times employed are generally correct within a second of time. If they differ too widely, the computer must use his own judgment as to making further corrections and computations.

Position-angle of Point of Contact.—The position-angle P, of the point of contact, reckoned from the north point of the Sun's limb toward the east, is found by the formula—

$$P = N - \psi \pm 180^\circ \quad \text{for the beginning,}$$
$$P = N + \psi \quad \text{for the ending,}$$

it being assumed that, in each case, the value of ψ is taken between the limits ± 90°.

Computation of the Solar Eclipse of 1909, June 17, for Ogden, Utah.

The position of Ogden is—

	°	′	″
Latitude, $\varphi =$	+ 41	13	9
Longitude, $\lambda =$	+111	59	54

and its geocentric coordinates are—

$$\rho \sin \varphi' = 9.81653$$
$$\rho \cos \varphi' = 9.87697$$

From the Eclipse Chart we find the approximate times of the phases to be—

	d	h	m	
Beginning June	17	12	20	Greenwich Mean Time.
Ending	17	13	30	

Greenwich Mean Time, T, June 17	Beginning. $12^h\ 20^m$	Ending. $13^h\ 30^m$
	° ′ ″	° ′ ″
μ	184 50 36	202 20 30
λ	+ 111 59 54	+ 111 59 54
$\mu-\lambda$	72 50 42	90 20 36
$\rho \cos \varphi'$	9.87697	9.87697
$\sin (\mu-\lambda)$	9.98024	9.99999
$\log \xi$	9.85721	9.87696
ξ	+ 0.71980	+ 0.75328
$\rho \sin \varphi'$	9.81653	9.81653
$\cos d$	9.96275	9.96275
$\log \eta_1$	9.77928	9.77928
η_1	+ 0.60156	+ 0.60156

	Beginning.	Ending.
$\rho \cos \varphi'$	9.87697	9.87697
$\sin d$	9.59881	9.59884
$\cos (\mu - \lambda)$	9.46976	7.77759 *n*
$\log \eta_2$	8.94554	7.25340 *n*
η_2	+ 0.08821	− 0.00179
$\eta = \eta_1 - \eta_2$	+ 0.51335	+ 0.60335
$\rho \sin \varphi' \sin d$	9.41534	9.41537
ζ_1	+ 0.26022	+ 0.26024
$\rho \cos \varphi' \cos d \cos (\mu - \lambda)$	9.30948	7.61731 *n*
ζ_2	+ 0.20393	− 0.00414
$\zeta = \zeta_1 + \zeta_2$	+ 0.46415	+ 0.25610
const. log	7.63992	7.63992
$\rho \cos \varphi' \cos (\mu - \lambda)$	9.34673	7.65456 *n*
$\log \xi'$	6.98665	5.29448 *n*
ξ'	+ 0.000970	− 0.000020
const. log	7.63992	7.63992
$\xi \sin d$	9.45602	9.47580
$\log \eta'$	7.09594	7.11572
η'	+ 0.001247	+ 0.001305
$x - \xi$	− 0.27882	+ 0.32064
$y - \eta$	+ 0.44620	+ 0.43692
$x' - \xi'$	+ 0.008073	+ 0.009063
$y' - \eta'$	− 0.000090	− 0.000156
$m \sin M$	9.44532 *n*	9.50602
$m \cos M$	9.64953	9.64040
$\tan M$	9.79579 *n*	9.86562
M	328° 0′ 0″	36° 16′ 25″
$\sin M$	9.72421 *n*	9.77206
$\log m$	9.72111	9.73396
$n \sin N$	7.90703	7.95727
$n \cos N$	5.95424 *n*	6.19312 *n*
$\tan N$	1.95279 *n*	1.76415 *n*
N	90° 38′ 19″	90° 59′ 10″
$\sin N$	9.99997	9.99994
$\log n$	7.90706	7.95733
$\tan f$	7.66288	7.66288
$\log \zeta$	9.66666	9.40841
	7.32954	7.07129
$\zeta \tan f$	+ 0.00214	+ 0.00118
l	+ 0.54631	+ 0.54641
L	+ 0.54417	+ 0.54523
$M - N$	237° 21′ 41″	305° 17′ 15″
$\sin (M - N)$	9.92535 *n*	9.91183 *n*
$\log m$	9.72111	9.73396
$\operatorname{colog} L$	0.26426	0.26342
$\sin \psi$	9.91072 *n*	9.90921 *n*

	Beginning.	Ending.
ψ	$-54° 30' 20''$	$-54° 13' 40''$
$\log \frac{m}{n}$	1.81405	1.77663
$\cos (M - N)$	9.73186 *n*	9.76168
	1.54591 *n*	1.53831
$-\frac{m}{n} \cos (M - N)$	+ 35.148	− 34.539
$\log L$	9.73574	9.73658
$\cos \psi$	9.76389	9.76683
colog n	2.09294	2.04267
	1.59257	1.54608
$\mp \frac{L \cos \psi}{n}$	− 39.135	+ 35.163
	m	m
τ	− 3.987	+ 0.624
	h m	h m
T	12 16.013	13 30.624

Since the value of τ for the beginning is rather large, we compute the correction $\delta\tau$ for this phase as follows:

	Beginning.
const. log	5.3100
$\log \xi$	9.8572
$\cos d$	9.9628
	5.1300
number	+ 0.0000135
l'	+ 0.0000015
sum	+ 0.0000150
log (sum)	5.1761
$\log (-\tau)$	0.6006
colog n	2.0929
$\sec \psi$	0.2361
	8.1057
(1)	+ 0.0128
$N - \psi$	145° 9′
$\sin (N - \psi)$	9.7570
$\log \xi$	9.8572
$\log \xi \sin (N - \psi)$	9.6142

	Beginning.
$\cos (N - \psi)$	9.9142 *n*
$\log \eta_2$	8.9455
$\log \eta_2 \cos (N - \psi)$	8.8597 *n*
$\xi \sin (N - \psi)$	+ 0.4113
$\eta_2 \cos (N - \psi)$	− 0.0724
diff.	+ 0.4837
log (diff.)	9.6846
const. log	4.9788 *n*
$\log \tau^2$	1.2012
colog $n \cos \psi$	2.3290
	8.1936 *n*
(2)	− 0.0156
	m
$(1) + (2) = \delta\tau$	− 0.0028
τ	− 3.987
τ_0	− 3.990

The corrected time of beginning is, therefore,

$$T_0 = \text{June } 17^d\ 12^h\ 16^m.010,$$

Whence we find—

	Beginning. d h m	Ending. d h m
Greenwich Mean Time,	June 17 12 16.010	17 13 30.624
λ	+ 7 27.994	+ 7 27.994
Local Mean Time,	June 17 4 48.016	17 6 2.630

Therefore we have—

	d h m s	
Beginning of the Eclipse,	June 17 4 48 1.0	Local Mean Time.
End of the Eclipse,	June 17 6 2 37.8	

	Beginning.		Ending.	
	°	'	°	'
$N \mp \phi$	145	8.6	36	45.5
constant	+180	0.0	0	0.0
Angle of position: P	325	8.6	36	45.5

from the north point of the Sun's disk toward the east for direct image.

Moon's Phases, Libration, etc.—Page 440 gives the Washington mean times of the Moon's phases, apogee, perigee, and greatest libration, together with the formulæ for finding the libration in longitude and latitude whenever required.

Mean Places of Stars Occulted During the Year.—Pages 441–444 contain, for the year 1909, the adopted mean places and annual proper motions of such stars as will be occulted by the Moon, but are not included in the list given on pages 304–311. These additional stars are necessary in order to provide each month a sufficient number brighter than the 6.55 magnitude which will be occulted at a distance of more than 25° from the Sun.

Elements of Occultations.—Pages 445–480 give the elements for the prediction of the times of occultations of stars and planets by the Moon during the current year. The system of co-ordinates employed is similar to that already described for eclipses, the fundamental plane passing through the center of the Earth, and being taken perpendicular to the line joining the star and the center of the Moon, but the cone circumscribing the Moon and star is regarded as a cylinder which intercepts the fundamental plane in a circle having the same linear diameter as the Moon.

In the columns referring to the star, those headed *Red'ns from* 1909.0 give the quantities necessary to reduce the mean place of the star at the beginning of 1909 to its apparent place at the time of occultation. These reductions are sufficiently accurate to be definitive.

Under the general head, *At Conjunction in R. A.*, are five columns giving certain quantities for the moment of geocentric conjunction of the Moon and star in right ascension, as follows:—

The *Washington Mean Time* is the moment, T, at which the two bodies are in geocentric conjunction in right ascension. At that moment the co-ordinate x of the axis of the cylinder on the fundamental plane has the value zero. The column *Hour Angle, H*, gives the common geocentric hour angle of the Moon and star at the same moment, expressed in sidereal time and counted from the meridian of Washington—positive toward the west and negative toward the east. Column Y gives the co-ordinate y of the axis of the cylinder upon the fundamental plane at the same moment. Columns x' and y' give the variations of x and y in one hour of mean time. The linear unit in these columns is the Earth's equatorial radius. The limiting parallels, north and south, show the extreme limits of latitude within which the occultation will be visible.

By the aid of these elements, the Washington mean time of immersion and emersion of a star relatively to the limb of the Moon may be computed for any part of the Earth by a method nearly the same as that already explained for computing eclipses, but somewhat more simple.

Prediction of Occultations for a Given Place.—When it is desired to predict the circumstances of one or more occultations at any place, the first step will be to select them from the general list given in the Ephemeris. The conditions of visibility are:—

1. The limiting parallels in the last columns must include the latitude of the place.
2. The quantity $H - \lambda$, taken without regard to sign, must be less than the semi-diurnal arc of the star by at least one hour. On very rare occasions an emersion might be seen in the east, or an immersion in the west, when this difference is a few minutes less than an hour.

3. The Sun must not be much more than an hour above the horizon at the local mean time $T - \lambda$, unless the star is bright enough to be seen in the daytime.

When many occultations are to be selected, the most convenient course will be to write the value of $-\lambda$ on the bottom of a slip of paper, and in passing through the list of occultations, to pause over each one for which condition (1) is fulfilled, and examine by means of the slip whether conditions (2) and (3) are also fulfilled. If either fails, the computer passes on. Sometimes it will be difficult to determine whether $H - \lambda$ or $T - \lambda$ falls within the limits; and in such cases the computer may mark the occultation for trial and leave the decision for the subsequent operations. The whole list can be gone over in less than a day, and it will probably be found that about one-tenth of the occultations are marked for trial.

The next step will be to compute the local times of immersion and emersion from the elements, and to that end let—

T = the instant of geocentric conjunction of Moon and star in right ascension, expressed in Washington mean solar time;
H = the Washington west hour angle of the two bodies at that moment;
λ = the longitude west of Washington;
$h_0 = H - \lambda$ = the local hour angle of the star at the instant T;
δ = the star's declination.

The procedure for each occultation will then be as follows:—

(1) The geocentric co-ordinates of the place, $\rho \sin \varphi'$ and $\rho \cos \varphi'$, are to be computed by the formulæ and table given in connection with eclipses on page 575.

The next step will be to find the approximate instant of apparent conjunction of the Moon and star as seen from the place, and that may be deduced from the time of geocentric conjunction by the application of an approximate correction taken from Mr. Downes's table, printed in the volumes of the American Ephemeris for 1882 to 1899. This correction must be reckoned in mean solar hours, and will be designated by the symbol t. It will have the same sign as h_0.

When Downes's table is not available, the correction may be computed from the formulæ,

$$\xi_0 = \rho \cos \varphi' \sin h_0$$
$$\xi' = [9.4192] \cos \frac{4}{3} h_0$$
$$t = \frac{\xi_0}{x' - \xi'}$$

By applying t to the Washington mean time of geocentric conjunction, as given with the elements, we shall have the Washington mean time of local conjunction within a few minutes.

(2) Compute for the instant $T + t$ the following quantities, in which t_0 is the sidereal equivalent of the mean time interval t:

$$\xi = \rho \cos \varphi' \sin (h_0 + t_0)$$
$$\eta = \rho \sin \varphi' \cos \delta - \rho \cos \varphi' \sin \delta \cos (h_0 + t_0) = \eta_1 - \eta_2$$
$$\xi' = [9.4192]\, \rho \cos \varphi' \cos (h_0 + t_0)$$
$$\eta' = [9.4192]\, \rho \cos \varphi' \sin \delta \sin (h_0 + t_0) = [9.4192]\, \xi \sin \delta$$
$$x = x't$$
$$y = Y + y't$$

Compute also m, M, n, N, and ψ from the equations

$$m \sin M = x - \xi$$
$$m \cos M = y - \eta$$

$$n \sin N = x' - \xi'$$
$$n \cos N = y' - \eta'$$
$$\sin \psi = [0.5646]\, m \sin (M - N)$$

ψ being taken between the limits ± 90°. Finally compute

$$\tau = -\frac{[1.7782]m}{n} \cos (M - N) \mp \frac{[1.2135]}{n} \cos \psi$$

$$\delta\tau = \frac{[6.7591]\tau^2}{n \cos \psi} [\eta_2 \cos (N \mp \psi) - \xi \sin (N \mp \psi)]$$

where the double signs are to be taken negative for an immersion and positive for an emersion. Both τ and $\delta\tau$ thus have two values, which are expressed in minutes of time, and in order to distinguish them let those pertaining to immersion be designated respectively τ' and $\delta\tau'$, while those pertaining to emersion are designated τ'' and $\delta\tau''$. We then have for the Washington mean times of the phases

$$\text{Instant of immersion} = T + t + \tau' + \delta\tau'$$
$$\text{Instant of emersion} = T + t + \tau'' + \delta\tau''$$

These expressions are practically exact, as the corrections $\delta\tau$ seldom amount to so much as 1.5 minutes, and whenever an inaccuracy of that magnitude is permissible they may be omitted. As a check upon the results, it will be advisable to compute ξ, η, x, and y for the times of immersion and emersion finally obtained. If these times are correct the quantities in question will fulfill the condition,

$$\sqrt{(x - \xi)^2 + (y - \eta)^2} = 0.2725$$

If log $m \sin (M - N) > 9.4354$, $\sin \psi$ will be numerically greater than unity, and no occultation is to be expected at the given place; but a very brief one may occur if the excess of the computed distance over the Moon's semidiameter happens to be within the errors of the ephemerides of the Moon and star.

The position-angle of the line from the Moon's center to the star, at the time of contact, is reckoned from the north point toward the east, and designated by the symbol P. It is computed from the formula,

$$P = N - \psi + \delta P \qquad \text{for immersion,}$$
$$P = N + \psi + \delta P \pm 180^\circ \quad \text{for emersion,}$$

where the angles $N - \psi$ and $N + \psi$ are taken directly from the computation of $\delta\tau$, and δP is found in degrees of arc from the expression

$$\delta P = \mp \frac{[7.3038]\tau^2}{\cos \psi} [\eta_2 \sin N + \xi \cos N]$$

In the latter formula the double sign is to be taken negative for an immersion and positive for an emersion.

The angle from the vertex, V, is also reckoned in the direction from the north toward the east, and is found from the formula,

$$V = P - C$$

where C is computed from the expression

$$\tan C = \frac{\xi + [8.2218]\tau\xi' - [4.9810]\tau^2\xi}{\eta + [8.2218]\tau\eta' + [4.9810]\tau^2\eta_2}$$

C being taken less or greater than 180°, according as the numerator is positive or negative.

The value of τ employed in the latter formula must be so taken as to correspond with the phase for which C is required.

In the volumes of the American Ephemeris for the years 1882 to 1901 instructions are given for constructing three special tables which greatly diminish the labor of computing occultations, but as these tables should contain from 4 700 to 6 300 quantities, and as they would apply only to the place for which they were computed, it will rarely be worth while to undertake the labor of forming them. Those who desire further information on the subject may consult any one of the volumes in question.

As an example of an isolated occultation, we will compute that of 37 Capricorni on November 19, 1909, for Nashville, whose position is—

$$\varphi = +\ 36^\circ\ \ 8'\ \ 54''.4$$
$$\lambda = +\ \ 0^h\ 38^m\ \ 56^s.4$$

and whose geocentric co-ordinates are—

$$\rho \sin \varphi' = 9.7683$$
$$\rho \cos \varphi' = 9.9076$$

From the elements on page 476, we have

$$T = \ \ \overset{h}{7}\ \overset{m}{52.6}$$
$$H = +\ 2\ \ 16.4$$

and $h_0 = H - \lambda = +\ 1\ \ 37.5$

From the formulæ on page 581, we find the correction, t, to the Washington mean time of geocentric conjunction, T, to be about $+0^h\ 59^m.2$; therefore the Washington mean time of apparent conjunction is—

$$T + t = \text{Nov. } 19^d\ 8^h\ 51^m.8.$$

37 Capricorni.	Apparent Declination.	W. T. of ☌	Hour Angle.	Y	x'	y'
	° ′	d h m	h m			
	− 20 29.4	Nov. 19 7 52.6	+ 2 16.4	+ 0.4269	0.5594	+ 0.1682

$T + t$	Nov. 19^d 8^h $51^m.8$
h_0	+ 1 37.5
t_0	+ 0 59.4
$h_0 + t_0$	+ 2 36.9
$\rho \cos \varphi'$	9.9076
$\sin (h_0 + t_0)$	9.8010
$\log \xi$	9.7086
ξ	+ 0.5112
$\rho \sin \varphi'$	9.7683
$\cos \delta$	9.9716
$\log \eta_1$	9.7399
η_1	+ 0.5494
$\rho \cos \varphi'$	9.9076
$\sin \delta$	9.5441 *n*
$\cos (h_0 + t_0)$	9.8891
$\log \eta_2$	9.3408 *n*
η_2	− 0.2192
$\eta_1 - \eta_2 = \eta$	+ 0.7686
const. log	9.4192
$\rho \cos \varphi' \cos (h_0 + t_0)$	9.7967
$\log \xi'$	9.2159

ξ'	+ 0.1644
const. log	9.4192
$\xi \sin \delta$	9.2527 *n*
$\log \eta'$	8.6719 *n*
η'	− 0.0470
$\log x'$	9.7477
$\log t$	9.9942
$\log x$	9.7419
x	+ 0.5520
$\log y'$	9.2258
$\log y'\ t$	9.2200
$y'\ t$	+ 0.1660
Y	+ 0.4269
y	+ 0.5929
$x - \xi$	+ 0.0408
$y - \eta$	− 0.1757
$x' - \xi'$	+ 0.3950
$y' - \eta'$	+ 0.2152
$m \sin M$	8.6107
$m \cos M$	9.2448 *n*
$\tan M$	9.3659 *n*

$T+t$	Nov. 19^d 8^h $51^m.8$
M	166° 56′
cos M	9.9886 n
log m	9.2562
n sin N	9.5966
n cos N	9.3328
tan N	0.2638
N	61° 25′
sin N	9.9436
log n	9.6530
const. log	0.5646
log m	9.2562
sin $(M-N)$	9.9839
sin ψ	9.8047

ψ	39° 38′
const. log	1.7782 n
log $\frac{m}{n}$	9.6032
cos $(M-N)$	9.4274 n
	0.8088
$-\frac{[1.7782]\,m}{n}\cos(M-N)$	+ 6.44
const. log	1.2135
colog n	0.3470
cos ψ	9.8866
	1.4471
$\mp\frac{[1.2135]\cos\psi}{n}$	$\mp$ 28.00
	m
τ for immersion	− 21.56
τ for emersion	+ 34.44

The computation of $\delta\tau$ for the two contacts is as follows:

		Immersion.	Emersion.
$N\mp\psi$		21° 47′	101° 3′
cos $(N\mp\psi)$		9.9678	9.2825 n
log η_2		9.3408 n	9.3408 n
log (1)		9.3086 n	8.6233
(1)		− 0.2035	+ 0.0420
sin $(N\mp\psi)$		9.5695	9.9919
log ξ		9.7086	9.7086
log (2)		9.2781	9.7005
(2)		+ 0.1897	+ 0.5018
(1) − (2)		− 0.3932	− 0.4598
log [(1) − (2)]		9.5946 n	9.6626 n
const. log		6.7591	6.7591
log τ^2		2.6673	3.0741
colog (n cos ψ)		0.4604	0.4604
log $\delta\tau$		9.4814 n	9.9562 n
$\delta\tau$		− 0.30	− 0.90
$\tau+\delta\tau$		− 21.86	+ 33.54
		d h m	h m
$T+t$	Nov.	19 8 51.8	8 51.8
Washington Mean Time of Phase,	"	19 8 29.9	9 25.3
λ		+ 0 38.9	+ 0 38.9
Nashville Mean Time,	"	19 7 51.0	8 46.4

To find δP and P:

log η_2	9.3408 n	log ξ	9.7086	(3)	− 0.1925
sin N	9.9436	cos N	9.6798	(4)	+ 0.2446
log (3)	9.2844 n	log (4)	9.3884	(3) + (4)	+ 0.0521

	Immersion.	Emersion.
log [(3) + (4)]	8.7168	8.7168
const. log	7.3038 n	7.3038
log τ^2	2.6673	3.0741
colog cos ψ	0.1134	0.1134
log δP	8.8013 n	9.2081

		°	°
	δP	— 0.06	+ 0.16
	$N \mp \psi$	21.8	101.0
	const.	0.0	180.0
Angle of position:	P	21.7	281.2

from the north point of the Moon's limb toward the east, for direct image.

Occultations Visible at Washington, pages 480–482.—Here are given in detail all the data necessary for observing every occultation of the general list which is visible at Washington during the current year.

Phenomena of Planets and Satellites, pages 483–518.—These are, for the most part, sufficiently explained in the body of the work, but the following additional explanations may be of service in some cases:—

Disks of Mercury, Venus, and Mars, pages 483–485.—The angle θ, needed in reducing meridian observations, is the angle which the arc of the great circle from the planet to the Sun makes with the arc from the planet toward the west, reckoned in the direction west, north, east, south. This position-angle is reckoned from 0° to 360°, as in the measurement of double stars, the planet taking the place of the central star, but its measure is 90° greater than in the case of a double star.

We may also regard θ as expressing the angle which the line of cusps makes with the meridian, the positive direction of the meridian being toward the north, and the positive direction of the line of cusps that in which a person following this line would have the illuminated portion of the disk on his right.

Satellites of Mars, page 486.—This page gives the diagram and ephemerides of the satellites, together with their position-angles and distances from the center of the planet.

Satellites of Jupiter, pages 487–511.—The abbreviations designating the phenomena are explained at the foot of each page.

Satellites of Saturn, pages 512–516.—The explanations are given on pages 512 and 513, the Washington mean times of greatest elongations on pages 513 to 515, and the apparent elements of the rings on page 515. The differences in right ascension and declination between Phœbe and Saturn for 1906 and 1909 are given on page 516.

Satellites of Uranus, page 517.—This page gives the diagram and ephemerides of the satellites, together with their position-angles and distances from the center of the planet.

Satellite of Neptune, page 518.—This page gives the diagram and ephemerides of the satellite, together with the position-angles and distances from the center of the planet.

Phenomena, pages 519–520.—The predicted times of the conjunctions, quadratures, and oppositions of the planets with respect to the Sun are respectively the instants when the longitude of each planet differs from that of the Sun by 0°, ± 90°, or 180°.

For the conjunction of the planets with the Moon, and with each other, the predicted times are the instants when the two bodies have the same right ascension. The degrees and minutes to the right show the difference of declination at the moment of conjunction.

Positions of Observatories, pages 521–525.—The latest available data have been used in compiling these positions, and many of them have been furnished through the courtesy of the directors of the several observatories in response to a circular issued by this office. The values given for the *Reduction to Geocentric Latitude* and *Log ρ* are based upon Col. A. R. CLARKE's elements of the terrestrial spheroid, published in 1866, from which we have—

$$\log e = 8.915\,2515$$

$$\varphi' - \varphi = -\,11'\;40''.44 \sin 2\varphi + 1''.19 \sin 4\varphi$$

$$\log \rho = 9.999\,2645 + 0.000\,7374 \cos 2\varphi - 0.000\,0019 \cos 4\varphi$$

PART IV—STAR NUMBERS, APPARENT PLACES OF STARS, AND OTHER DATA, BASED ON THE CONSTANTS OF THE PARIS CONFERENCE OF MAY, 1896.

Page 528 contains the formulæ for reducing the positions of the fixed stars and for computing the star-numbers, the whole expressed in terms of the notation of Bessel and the constants of the Paris Conference of May, 1896.

Page 529 contains the usual data for precession, nutation, obliquity of the ecliptic, and the Sun's aberration, all of which will be rendered sufficiently clear by the explanations given on pages 569–570 respecting the similar data on pages 285–286.

Pages 530–533 contain the logarithms of the *Besselian Star-Numbers A, B, C, D,* for each Washington mean midnight, and pages 534–541 contain the *Independent Star-Numbers* for the same dates; to all of which the explanations given on pages 570–571 apply, except that the formulæ on page 528 must be employed instead of those on page 290.

Pages 542–553 contain the apparent positions of the five circumpolar stars, α, 6 B, δ, and λ Ursæ Minoris and 51 Cephei, for their upper transit at Washington. The arrangement of the data is the same as on pages 312–323, and consequently the explanations given on page 571 apply here also.

Pages 554–558 contain, for every tenth upper transit at Washington, the apparent places of 25 stars, being all those embraced in the list on pages 304–311 whose declination exceeds ± 78° 30′, except the five circumpolar stars. For stars of less declination than ± 78° 30′ the apparent places derived by using the constants of the Paris Conference differ from those derived by using the constants of Struve and Peters by quantities which never exceed $0^{s}.015$ in right ascension or $0''.05$ in declination, and consequently, throughout that range, the places given on pages 324–399 may be regarded as correct for either set of constants; or, in other words, when using the constants of the Paris Conference the positions of all stars not contained in pages 554–558 may be taken with sufficient accuracy from pages 324–399. The explanation on page 571, respecting the data on pages 324–399, applies also to pages 554–558.

Latitude by Observed Altitude of Polaris, page 599.—Table IV, page 599, replaces the Tables A, B, C, D, given as a *Supplement* to the volumes of the Ephemeris for 1874 to 1881, and is intended for use at sea and reconnaissance on land. It is constructed upon the assumption that Polaris has a declination of $+88° 49'.3$, and an observed altitude of 45°, and will furnish an approximate value of the latitude, the probable error of which, in so far as the table is concerned, will be a few tenths of a minute of arc.

The directions for using the table are adapted to an assumed right ascension of $1^{h} 26^{m}.5$ for Polaris, but somewhat greater accuracy may be insured by substituting the right ascension for the date of observation, from pages 312–323 of this volume.

APPENDIX.

ON THE CONSTRUCTION OF THE AMERICAN EPHEMERIS AND NAUTICAL ALMANAC FOR 1909.

Among American astronomers there are wide differences of opinion respecting the decisions of the PARIS CONFERENCE of May, 1896, and for that reason it has been thought best to give, in the American Ephemeris for 1909, two wholly distinct sets of constants for precession, nutation, aberration, and mean obliquity of the ecliptic, namely: first, those of STRUVE and PETERS, and second, those adopted by the PARIS CONFERENCE of 1896. Their values for 1909.0 are as follows:

	Struve and Peters. ″	Paris Conference. ″
Precession . . .	50.2659	50.2584
Nutation . . .	9.2241	9.21
Aberration . . .	20.4451	20.47
Mean Obliquity .	23° 27′ 3″.58	23° 27′ 4″.04

The constants of STRUVE and PETERS are employed in the quantities on pages 286 to 399, and those of the PARIS CONFERENCE in the quantities on pages 528 to 558, and thus everyone is left free to choose between them. For stars distant more than 11° 30′ from either pole, the apparent places derived by using the constants of the PARIS CONFERENCE differ from those derived by using the constants of STRUVE and PETERS by quantities which never exceed $0^s.015$ in right ascension, and 0″.05 in declination, and consequently throughout that region the star ephemerides given on pages 324 to 399 may be regarded as correct for either set of constants. For the five circumpolar stars, and twenty-five other stars whose declinations exceed ±78° 30′ two sets of ephemerides are given; one depending upon the constants of STRUVE and PETERS, and the other depending upon the constants of the PARIS CONFERENCE.

The formulæ for the reduction of stars from mean to apparent place, using the constants of STRUVE and PETERS, are given on page 290.

The nutation given on page 286, and used in the Besselian and independent star-numbers, page 303; in f', pages 295 to 302, and in the ephemerides of the apparent places of the fixed stars for every tenth transit, pages 324 to 399, is computed with the values of A' and B' given on page 290, while the nutation used in the Besselian and independent star-numbers (except f') given on pages 291 to 302 is computed with the values of A and B given on page 290.

In the daily ephemeris of the five circumpolar stars given on pages 312 to 323 the nutation is computed with—

$$
\begin{aligned}
A = \tau &- \overset{\prime\prime}{0}.342\,55 \sin \Omega \\
&+ 0.004\,10 \sin 2\Omega \\
&- 0.025\,19 \sin 2\odot \\
&+ 0.002\,93 \sin (\odot + 81^\circ\, 51') \\
&+ 0.000\,25 \sin (2\odot - \Omega) \\
&- 0.000\,11 \sin (3\odot - \Gamma) \\
&- 0.000\,05 \sin 2(\odot - \Omega) \\
&+ 0.000\,10 \sin 2(\odot - \Gamma') \\
&+ 0.000\,09 \sin (2\Gamma' - \Omega) \\
&+ 0.000\,05 \cos \Gamma' \\
&+ 0.000\,04 \sin 2\Gamma' \\
&- 0.004\,05 \sin 2\text{☾} \\
&+ 0.001\,35 \sin (\text{☾} - \Gamma')
\end{aligned}
$$

$$
\begin{aligned}
B = &- \overset{\prime\prime}{9}.2241 \cos \Omega \\
&+ 0.0895 \cos 2\Omega \\
&- 0.5506 \cos 2\odot \\
&- 0.0092 \cos (\odot + 281^\circ\, 23') \\
&- 0.0027 \cos (3\odot - \Gamma) \\
&+ 0.0067 \cos (2\odot - \Omega) \\
&+ 0.0024 \cos (2\Gamma' - \Omega) \\
&- 0.0023 \sin \Gamma' \\
&+ 0.0008 \cos 2\Gamma' \\
&- 0.0885 \cos 2\text{☾}
\end{aligned}
$$

and the result in right ascension is diminished by the quantity $f - f' = -0''.1866 \sin 2\text{☾} + 0''.0622 \sin (\text{☾} - I'')$, which is the same for all stars.

The formulæ for the reduction of stars from mean to apparent place, using the constants of the PARIS CONFERENCE, are given on page 528.

The nutation on page 529 includes only the terms in ☊, 2☊, L, 2L, and 3L. This value of the nutation has been used in all the ephemerides of the Sun, Moon, and planets, in the apparent places of the stars for every tenth transit given on pages 554 to 558, and in f' on pages 534 to 541. The nutation used in the daily ephemerides of the circumpolar stars, pages 542 to 553, is computed with—

$$\begin{array}{ll} & '' \\ A = \tau & -\ 0.342\,18 \sin \text{☊} \\ & +\ 0.004\,15 \sin 2\text{☊} \\ & -\ 0.024\,95 \sin 2\mathrm{L} \\ & +\ 0.002\,18 \sin (\mathrm{L} + 75.3^\circ) \\ & -\ 0.000\,97 \sin (3\mathrm{L} + 78\,7^\circ) \\ & +\ 0.000\,25 \sin (2\mathrm{L} - \text{☊}) \\ & -\ 0.000\,05 \sin 2(\mathrm{L} - \text{☊}) \\ & +\ 0.000\,10 \sin 2(\mathrm{L} - \Gamma') \\ & +\ 0.000\,09 \sin (2\Gamma' - \text{☊}) \\ & +\ 0.000\,05 \cos \Gamma' \\ & +\ 0.000\,04 \sin 2I'' \\ & -\ 0.004\,05 \sin 2\text{☾} \\ & +\ 0.001\,35 \sin (\text{☾} - \Gamma') \end{array} \qquad \begin{array}{ll} & '' \\ B = & -\ 9.2100 \cos \text{☊} \\ & +\ 0.0900 \cos 2\text{☊} \\ & -\ 0.5460 \cos 2\mathrm{L} \\ & -\ 0.0210 \cos (3\mathrm{L} + 78.7^\circ) \\ & +\ 0.0090 \cos (\mathrm{L} - 78.7^\circ) \\ & +\ 0.0067 \cos (2\mathrm{L} - \text{☊}) \\ & +\ 0.0024 \cos (2\Gamma' - \text{☊}) \\ & -\ 0.0023 \sin \Gamma' \\ & +\ 0.0008 \cos 2\Gamma' \\ & -\ 0.0885 \cos 2\text{☾} \end{array}$$

and the result in right ascension is diminished by the quantity $f - f' = -0''.1866 \sin 2\text{☾} + 0''.0622 \sin (\text{☾} - \Gamma')$, which is the same for all stars.

The terms of short period in the nutation given on pages 287 and 288 are included in the values of the star-numbers on pages 530 to 541. They are derived in accordance with the formulæ-

$$\begin{aligned} \delta''\psi &= \text{Nutation in longitude} = A''\psi \\ \delta''\omega &= \text{Nutation in obliquity} \ = -B'' \end{aligned}$$

where ψ = the luni-solar precession $= 50''.3713$, and A'' and B'' are respectively the short period terms in the expressions for A and B on page 528. By short period terms are meant all terms involving the Moon's mean longitude.

According to the formulæ on pages 290 and 528, the star constants $a, b, c, d, a', b', c', d'$, are computed for each star from its mean place at the beginning of the year, but if strict accuracy is required they should be computed from the star's mean place at date, and the following second order terms should be added to the usual expressions for the reduction from mean to apparent place, namely—

$$\begin{array}{l} \text{To } \alpha - \alpha_0 \\ \quad {}^{s} \\ \left.\begin{array}{l} +\ 0.000\,003\ \tau^2 \sin \alpha \\ -\ 0.000\,149\ \tau^2 \cos \alpha \end{array}\right\} \tan \delta \\ \left.\begin{array}{l} -\ 0.000\,0650\ \tau^2 \sin 2\alpha \\ +\ 0.000\,0103 \sin 2\text{☊} \cos 2\alpha \\ -\ 0.000\,0107 \cos 2\text{☊} \sin 2\alpha \end{array}\right\} \tan^2\delta \\ \left.\begin{array}{l} +\ 0.000\,0620 \sin 2\odot \cos 2\alpha \\ -\ 0.000\,0622 \cos 2\odot \sin 2\alpha \end{array}\right\} \sec^2\delta \end{array} \qquad \begin{array}{l} \text{To } \delta - \delta_0 \\ \quad {}'' \\ \left.\begin{array}{l} +\ 0.000\,975\ \tau^2 \sin^2\alpha \\ -\ 0.000\,023 \cos 2\text{☊} \\ -\ 0.000\,080 \cos 2\text{☊} \cos 2\alpha \\ -\ 0.000\,077 \sin 2\text{☊} \sin 2\alpha \\ +\ 0.000\,040 \cos 2\odot \\ -\ 0.000\,467 \cos 2\odot \cos 2\alpha \\ -\ 0.000\,465 \sin 2\odot \sin 2\alpha \end{array}\right\} \tan \delta \end{array}$$

To $\alpha-\alpha_0$

$$\left.\begin{array}{l} \overset{s}{+}\,0.000\,0513 \sin(\odot+\text{☊})\cos 2\alpha \\ -\,0.000\,0507 \cos(\odot+\text{☊})\sin 2\alpha \\ +\,0.000\,0097 \sin(\odot-\text{☊})\cos 2\alpha \\ -\,0.000\,0053 \cos(\odot-\text{☊})\sin 2\alpha \end{array}\right\}\tan\delta\sec\delta$$

To $\delta-\delta_0$

$$\left.\begin{array}{l} \overset{\prime\prime}{-}\,0.000\,039 \cos(\odot+\text{☊}) \\ -\,0.000\,380 \cos(\odot+\text{☊})\cos 2\alpha \\ -\,0.000\,385 \sin(\odot+\text{☊})\sin 2\alpha \\ -\,0.000\,380 \cos(\odot-\text{☊}) \\ -\,0.000\,040 \cos(\odot-\text{☊})\cos 2\alpha \\ -\,0.000\,072 \sin(\odot-\text{☊})\sin 2\alpha \end{array}\right\}\sin\delta\tan\delta$$

These terms are negligible for stars whose declination is numerically less than 80°, but in computing the apparent places given in the American Ephemeris they have been applied whenever sensible.

The mean places of 383 stars, pages 304 to 311, are from the new *Catalogue of Fundamental Stars, for the epochs* 1875 *and* 1900, *Astronomical Papers of the American Ephemeris*, vol. VIII, part 2, prepared in this office, principally under the direction of Professor NEWCOMB.

The apparent places of Sirius and Procyon have been corrected for the effect of orbital motion, as determined from AUWERS' investigations, and tabulated in *Astronomical Papers of the American Ephemeris*, vol. I, pages 297–298. The values of these corrections are—

Year.	Sirius. s	Sirius. ″	Procyon. s	Procyon. ″
1909.0	$\Delta\alpha = -0.120$	$\Delta\delta = +0.38$	$\Delta\alpha = -0.037$	$\Delta\delta = -0.90$
1910.0	$\Delta\alpha = -0.127$	$\Delta\delta = +0.26$	$\Delta\alpha = -0.046$	$\Delta\delta = -0.80$

The ephemeris of the Sun is constructed from Professor NEWCOMB'S *Tables of the Sun, Astronomical Papers of the American Ephemeris*, vol. VI, part 1.

The adopted value of the mean equatorial horizontal parallax of the Sun is 8″.80, *Paris Conference, May, 1896.*

The adopted apparent semidiameter of the Sun at the Earth's mean distance is that found by Prof. WM. HARKNESS, from 35 842 meridian observations made at Greenwich, Paris, Washington, Königsberg, Milan, Madras, Dorpat, Modena, and Seeberg, viz., 16′ 1″.50; while in the computation of eclipses, the value given by AUWERS in the *Astronomische Nachrichten*, 1891, Bd. 128, S. 367, is employed, viz., 15′ 59″.63.

The Sun's rectangular equatorial co-ordinates are computed from the longitudes and latitudes by the following formulæ:—

$$\begin{aligned} X &= R\cos\lambda \\ Y &= R\sin\lambda\cos\omega - 19.3\,R\beta \\ Z &= R\sin\lambda\sin\omega + 44.5\,R\beta \end{aligned}$$

The reductions to mean equinox, 1909.0, are computed by the formulæ—

$$\begin{aligned} \Delta X &= +Y\sec\omega\,\Delta\lambda\sin 1'' \\ \Delta Y &= -X\cos\omega\,\Delta\lambda\sin 1'' + Z\,\Delta\omega\sin 1'' + 9.1\,\tau R\sin(\lambda+6^\circ) \\ \Delta Z &= -X\sin\omega\,\Delta\lambda\sin 1'' - Y\Delta\omega\sin 1'' - 21.0\,\tau R\sin(\lambda+6^\circ) \end{aligned}$$

where the numerical coefficients are in units of the seventh place of decimals and

R=the Sun's radius vector;
λ=the Sun's true longitude;
β=the Sun's true latitude, expressed in seconds of arc;
ω=the obliquity of the ecliptic;
$\Delta\lambda$=the reduction of longitude for precession and nutation from the beginning of the Besselian fictitious year;
$\Delta\omega$=the reduction of the mean to the apparent obliquity;
τ=the fraction of the year since the beginning of the Besselian fictitious year.

The longitude, latitude, and parallax of the Moon are derived from HANSEN's *Tables de la Lune*, London, 1857, the mean longitude being corrected in accordance with Professor NEWCOMB's *Researches on the Motion of the Moon*, Part I, page 268,* and Table XXXIV being replaced by a corrected one.

The apparent semidiameter of the Moon is computed from the Moon's equatorial horizontal parallax, π, by the formula,

$$S = 0.272\,506\,\pi + 1''.50$$

where the constant 0.272 506 is based on data from occultations given by Mr. J. PETERS in the *Astronomische Nachrichten*, 1895, Bd. 138, S. 147; and the constant 1″.50 is added to cover the average effect of irradiation. The value of the Moon's semidiameter employed in the computation of eclipses for 1909 was computed from the formula,

$$S = 0.272\,274\,\pi$$

the constant being the one used in this Ephemeris prior to 1902.

The ephemerides of Mercury, Venus, and Mars are derived from Professor NEWCOMB's tables of these planets, *Astronomical Papers of the American Ephemeris*, vol. VI, parts 2, 3, and 4.

The ephemerides of Jupiter and Saturn are derived from the tables constructed in this office by Dr. GEORGE W. HILL, *Astronomical Papers of the American Ephemeris*, vol. VII, parts 1 and 2.

The ephemerides of Uranus and Neptune are derived from Professor NEWCOMB's tables of these planets, *Astronomical Papers of the American Ephemeris*, vol. VII, parts 3 and 4.

The semidiameters of the planets are computed from the following values:—

	Semidiameter. ″ ″	Log Dist.	Authority.
Mercury	3.34	0.00	LE VERRIER, *Theory of Mercury*.
Venus	8.546 ± 0.086	0.00	PEIRCE, from the Washington Observations of 1845 and 1846, made with the Mural Circle.
Mars	2.842 ± 0.057	0.25	
Jupiter (polar)	18.78 ± 0.067	0.70	
Saturn (polar)	8.77 ± 0.039	0.95	
Uranus	1.68 ± 0.3	1.30	
Neptune	1.28	1.48	
Jupiter (equatorial)	20.00	0.70	
Saturn (equatorial)	9.38	0.95	

The elements of eclipses of the Sun and occultations of stars by the Moon are given in accordance with BESSEL's method, the special forms employed being a modification of those developed in CHAUVENET's *Spherical and Practical Astronomy*.

The satellites of Mars are computed from manuscript tables based upon elements deduced by Prof. WALTER S. HARSHMAN. His elements of Deimos are published in the *Astronomical Journal*, 1894, vol. XIV, p. 147; but those of Phobos are yet in manuscript.

The eclipses of Jupiter's satellites are computed from a *Continuation of* DAMOISEAU's *Tables*. The occultations, transits, etc., are computed from WOOLHOUSE's tables, published in the *British Nautical Almanac* for 1835; Table II of each satellite having been adapted to DAMOISEAU's tables.

The fifth satellite of Jupiter is computed from manuscript tables based upon unpublished elements deduced by Mr. J. ROBERTSON.

The elongations and conjunctions of the satellites and the position of the rings of Saturn are computed from manuscript tables based on Prof. H. STRUVE's elements as published in *Beobachtungen der Saturnstrabanten*, St. Petersburg, 1898. The differential coordinates of Phœbe have been computed from the elements and tables of Dr. F. E. Ross, printed in the Annuals of Harvard College, vol. LIII, No. VI.

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* *Astronomical Observations made at the U. S. Naval Observatory, Washington, 1875*, Appendix II.

The apparent dimensions of the rings of Saturn are computed from BESSEL'S data, except those for the dusky ring, which are based on the observations of Messrs. O. STRUVE, A. HALL, E. E. BARNARD, and T. LEWIS, at Pulkowa, Washington, Mount Hamilton, and Greenwich.

The elongations of the satellites of Uranus are computed from the data of Professor NEWCOMB'S *Uranian and Neptunian Systems, Washington Observations*, 1873, Appendix I.

The elongations of the satellite of Neptune are computed from manuscript tables based upon Prof. A. HALL'S elements published in the *Astronomical Journal*, 1898, vol. XIX, p. 65.

The following-named persons were engaged in the preparation of the American Ephemeris and Nautical Almanac for the year 1909:

Assistants and Employees.—H. B. HEDRICK, W. AUHAGEN, J. ROBERTSON, H. G. HODGKINS, W. T. CARRIGAN, E. D. TILLYER, ARTHUR SNOW, ARTHUR NEWTON, E. C. HOWELL, REUEL KEITH, ROBERDEAU BUCHANAN, E. B. DAVIS, A. DOOLITTLE, J. MCWILLIAM, H. F. M. HEDRICK, GEO. H. HALLETT, H. B. EVANS, THEO. I. KING, and GEO. B. MERRIMAN.

CORRECTION REQUIRED, ON ACCOUNT OF SECOND DIFFERENCES OF THE MOON'S MOTION, IN FINDING THE GREENWICH TIME CORRESPONDING TO A CORRECTED LUNAR DISTANCE.

Approximate Interval.		DIFFERENCE OF THE PROPORTIONAL LOGARITHMS IN THE EPHEMERIS.																									
		2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48	50	52
h m	h m	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s
0 0	3 0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0 10	2 50	0	0	0	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	3	3	3	3	3	3	3
0 20	2 40	0	1	1	1	1	2	2	2	2	2	3	3	3	3	4	4	4	4	5	5	5	5	6	6	6	6
0 30	2 30	0	1	1	2	2	2	2	3	3	3	4	4	5	5	5	6	6	6	7	7	7	8	8	8	9	9
0 40	2 20	0	1	1	2	2	3	3	3	4	4	5	5	6	6	6	7	7	8	8	9	9	10	10	10	11	11
0 50	2 10	1	1	2	2	3	3	4	4	5	5	5	6	6	7	7	8	8	9	9	10	10	11	12	12	13	13
1 0	2 0	1	1	2	2	3	3	4	4	5	6	6	7	7	8	8	9	9	10	10	11	12	12	13	13	14	14
1 10	1 50	1	1	2	2	3	4	4	5	5	6	6	7	8	8	9	9	10	11	11	12	12	13	14	14	15	15
1 20	1 40	1	1	2	3	3	4	4	5	6	6	7	7	8	9	9	10	10	11	12	12	13	14	14	15	15	16
1 30	1 30	1	1	2	3	3	4	4	5	6	6	7	8	8	9	9	10	11	11	12	12	13	14	14	15	16	16

		DIFFERENCE OF THE PROPORTIONAL LOGARITHMS IN THE EPHEMERIS.																							
		54	56	58	60	62	64	66	68	70	72	74	76	78	80	82	84	86	88	90	92	94	96	98	100
h m	h m	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s
0 0	3 0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0 10	2 50	4	4	4	4	4	4	4	4	5	5	5	5	5	5	5	6	6	6	6	6	6	6	6	7
0 20	2 40	7	7	7	7	8	8	8	8	9	9	9	9	10	10	10	10	11	11	11	11	12	12	12	12
0 30	2 30	9	10	10	10	11	11	12	12	12	13	13	13	14	14	14	14	15	15	16	16	16	17	17	17
0 40	2 20	12	12	13	13	13	14	14	15	15	16	16	16	17	17	18	18	19	19	19	20	20	21	21	22
0 50	2 10	14	14	15	15	16	16	16	17	17	18	19	19	20	20	21	21	22	22	22	23	23	24	24	25
1 0	2 0	15	16	16	17	17	18	18	19	19	20	21	21	22	22	23	23	24	24	25	25	26	27	27	28
1 10	1 50	16	17	17	18	18	19	19	20	21	21	22	22	23	24	24	25	25	26	27	27	28	28	29	30
1 20	1 40	17	17	18	19	19	20	20	21	21	22	23	23	24	25	25	26	26	27	28	28	29	29	30	31
1 30	1 30	17	18	18	19	19	20	21	21	22	23	23	24	24	25	25	26	27	27	28	29	29	30	31	31

		DIFFERENCE OF THE PROPORTIONAL LOGARITHMS IN THE EPHEMERIS.																		
		102	104	106	108	110	112	114	116	118	120	122	124	126	128	130	132	134	136	138
h m	h m	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s
0 0	3 0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0 10	2 50	7	7	7	7	7	7	7	8	8	8	8	8	8	8	8	9	9	9	9
0 20	2 40	13	13	13	13	14	14	14	14	15	15	15	15	15	16	16	16	16	17	17
0 30	2 30	18	18	18	19	19	19	20	20	20	21	21	21	22	22	22	23	23	24	24
0 40	2 20	22	22	23	23	24	24	25	25	25	26	26	27	27	28	28	28	29	29	30
0 50	2 10	26	26	26	27	27	28	29	29	29	30	30	31	31	32	32	33	33	34	34
1 0	2 0	28	29	29	30	30	31	31	32	33	33	34	34	35	35	36	37	37	38	38
1 10	1 50	30	31	31	32	32	33	34	34	35	35	36	37	37	38	38	39	40	40	41
1 20	1 40	31	32	33	33	34	34	35	35	36	37	38	38	39	39	40	41	41	42	42
1 30	1 30	32	32	33	34	34	35	35	36	36	37	38	39	39	40	40	41	42	42	43

The correction is to be added to the approximate Greenwich time when the proportional logarithms in the Ephemeris are decreasing, and subtracted when they are increasing.

TO BE SUBTRACTED FROM A SIDEREAL TIME INTERVAL.

Sidereal.	0^h	1^h	2^h	3^h	4^h	5^h	6^h	7^h	For Seconds.	
m	m s	m s	m s	m s	m s	m s	m s	m s	s	s
0	0 0.000	0 9.830	0 19.659	0 29.489	0 39.318	0 49.148	0 58.977	1 8.807	0	0.000
1	0 0.164	0 9.993	0 19.823	0 29.653	0 39.482	0 49.312	0 59.141	1 8.971	1	0.003
2	0 0.328	0 10.157	0 19.987	0 29.816	0 39.646	0 49.475	0 59.305	1 9.135	2	0.005
3	0 0.491	0 10.321	0 20.151	0 29.980	0 39.810	0 49.639	0 59.469	1 9.298	3	0.008
4	0 0.655	0 10.485	0 20.314	0 30.144	0 39.974	0 49.803	0 59.633	1 9.462	4	0.011
5	0 0.819	0 10.649	0 20.478	0 30.308	0 40.137	0 49.967	0 59.796	1 9.626	5	0.014
6	0 0.983	0 10.813	0 20.642	0 30.472	0 40.301	0 50.131	0 59.960	1 9.790	6	0.016
7	0 1.147	0 10.976	0 20.806	0 30.635	0 40.465	0 50.295	1 0.124	1 9.954	7	0.019
8	0 1.311	0 11.140	0 20.970	0 30.799	0 40.629	0 50.458	1 0.288	1 10.118	8	0.022
9	0 1.474	0 11.304	0 21.134	0 30.963	0 40.793	0 50.622	1 0.452	1 10.281	9	0.025
10	0 1.638	0 11.468	0 21.297	0 31.127	0 40.956	0 50.786	1 0.616	1 10.445	10	0.027
11	0 1.802	0 11.632	0 21.461	0 31.291	0 41.120	0 50.950	1 0.779	1 10.609	11	0.030
12	0 1.966	0 11.795	0 21.625	0 31.455	0 41.284	0 51.114	1 0.943	1 10.773	12	0.033
13	0 2.130	0 11.959	0 21.789	0 31.618	0 41.448	0 51.278	1 1.107	1 10.937	13	0.035
14	0 2.294	0 12.123	0 21.953	0 31.782	0 41.612	0 51.441	1 1.271	1 11.100	14	0.038
15	0 2.457	0 12.287	0 22.117	0 31.946	0 41.776	0 51.605	1 1.435	1 11.264	15	0.041
16	0 2.621	0 12.451	0 22.280	0 32.110	0 41.939	0 51.769	1 1.599	1 11.428	16	0.044
17	0 2.785	0 12.615	0 22.444	0 32.274	0 42.103	0 51.933	1 1.762	1 11.592	17	0.046
18	0 2.949	0 12.778	0 22.608	0 32.438	0 42.267	0 52.097	1 1.926	1 11.756	18	0.049
19	0 3.113	0 12.942	0 22.772	0 32.601	0 42.431	0 52.260	1 2.090	1 11.920	19	0.052
20	0 3.277	0 13.106	0 22.936	0 32.765	0 42.595	0 52.424	1 2.254	1 12.083	20	0.055
21	0 3.440	0 13.270	0 23.099	0 32.929	0 42.759	0 52.588	1 2.418	1 12.247	21	0.057
22	0 3.604	0 13.434	0 23.263	0 33.093	0 42.922	0 52.752	1 2.582	1 12.411	22	0.060
23	0 3.768	0 13.598	0 23.427	0 33.257	0 43.086	0 52.916	1 2.745	1 12.575	23	0.063
24	0 3.932	0 13.761	0 23.591	0 33.420	0 43.250	0 53.080	1 2.909	1 12.739	24	0.066
25	0 4.096	0 13.925	0 23.755	0 33.584	0 43.414	0 53.243	1 3.073	1 12.903	25	0.068
26	0 4.259	0 14.089	0 23.919	0 33.748	0 43.578	0 53.407	1 3.237	1 13.066	26	0.071
27	0 4.423	0 14.253	0 24.082	0 33.912	0 43.742	0 53.571	1 3.401	1 13.230	27	0.074
28	0 4.587	0 14.417	0 24.246	0 34.076	0 43.905	0 53.735	1 3.564	1 13.394	28	0.076
29	0 4.751	0 14.581	0 24.410	0 34.240	0 44.069	0 53.899	1 3.728	1 13.558	29	0.079
30	0 4.915	0 14.744	0 24.574	0 34.403	0 44.233	0 54.063	1 3.892	1 13.722	30	0.082
31	0 5.079	0 14.908	0 24.738	0 34.567	0 44.397	0 54.226	1 4.056	1 13.886	31	0.085
32	0 5.242	0 15.072	0 24.902	0 34.731	0 44.561	0 54.390	1 4.220	1 14.049	32	0.087
33	0 5.406	0 15.236	0 25.065	0 34.895	0 44.724	0 54.554	1 4.384	1 14.213	33	0.090
34	0 5.570	0 15.400	0 25.229	0 35.059	0 44.888	0 54.718	1 4.547	1 14.377	34	0.093
35	0 5.734	0 15.563	0 25.393	0 35.223	0 45.052	0 54.882	1 4.711	1 14.541	35	0.096
36	0 5.898	0 15.727	0 25.557	0 35.386	0 45.216	0 55.046	1 4.875	1 14.705	36	0.098
37	0 6.062	0 15.891	0 25.721	0 35.550	0 45.380	0 55.209	1 5.039	1 14.868	37	0.101
38	0 6.225	0 16.055	0 25.885	0 35.714	0 45.544	0 55.373	1 5.203	1 15.032	38	0.104
39	0 6.389	0 16.219	0 26.048	0 35.878	0 45.707	0 55.537	1 5.367	1 15.196	39	0.106
40	0 6.553	0 16.383	0 26.212	0 36.042	0 45.871	0 55.701	1 5.530	1 15.360	40	0.109
41	0 6.717	0 16.546	0 26.376	0 36.206	0 46.035	0 55.865	1 5.694	1 15.524	41	0.112
42	0 6.881	0 16.710	0 26.540	0 36.369	0 46.199	0 56.028	1 5.858	1 15.688	42	0.115
43	0 7.045	0 16.874	0 26.704	0 36.533	0 46.363	0 56.192	1 6.022	1 15.851	43	0.117
44	0 7.208	0 17.038	0 26.867	0 36.697	0 46.527	0 56.356	1 6.186	1 16.015	44	0.120
45	0 7.372	0 17.202	0 27.031	0 36.861	0 46.690	0 56.520	1 6.350	1 16.179	45	0.123
46	0 7.536	0 17.366	0 27.195	0 37.025	0 46.854	0 56.684	1 6.513	1 16.343	46	0.126
47	0 7.700	0 17.529	0 27.359	0 37.188	0 47.018	0 56.848	1 6.677	1 16.507	47	0.128
48	0 7.864	0 17.693	0 27.523	0 37.352	0 47.182	0 57.011	1 6.841	1 16.671	48	0.131
49	0 8.027	0 17.857	0 27.687	0 37.516	0 47.346	0 57.175	1 7.005	1 16.834	49	0.134
50	0 8.191	0 18.021	0 27.850	0 37.680	0 47.510	0 57.339	1 7.169	1 16.998	50	0.137
51	0 8.355	0 18.185	0 28.014	0 37.844	0 47.673	0 57.503	1 7.332	1 17.162	51	0.139
52	0 8.519	0 18.349	0 28.178	0 38.008	0 47.837	0 57.667	1 7.496	1 17.326	52	0.142
53	0 8.683	0 18.512	0 28.342	0 38.171	0 48.001	0 57.831	1 7.660	1 17.490	53	0.145
54	0 8.847	0 18.676	0 28.506	0 38.335	0 48.165	0 57.994	1 7.824	1 17.654	54	0.147
55	0 9.010	0 18.840	0 28.670	0 38.499	0 48.329	0 58.158	1 7.988	1 17.817	55	0.150
56	0 9.174	0 19.004	0 28.833	0 38.663	0 48.492	0 58.322	1 8.152	1 17.981	56	0.153
57	0 9.338	0 19.168	0 28.997	0 38.827	0 48.656	0 58.486	1 8.315	1 18.145	57	0.156
58	0 9.502	0 19.331	0 29.161	0 38.991	0 48.820	0 58.650	1 8.479	1 18.309	58	0.158
59	0 9.666	0 19.495	0 29.325	0 39.154	0 48.984	0 58.814	1 8.643	1 18.473	59	0.161
Sidereal.	0^h	1^h	2^h	3^h	4^h	5^h	6^h	7^h	For Seconds.	

TO BE SUBTRACTED FROM A SIDEREAL TIME INTERVAL.

Sidereal.	8^h	9^h	10^h	11^h	12^h	13^h	14^h	15^h	For Seconds.	
m	m s	m s	m s	m s	m s	m s	m s	m s	s	s
0	1 18.636	1 28.466	1 38.296	1 48.125	1 57.955	2 7.784	2 17.614	2 27.443	0	0.000
1	1 18.800	1 28.630	1 38.459	1 48.289	1 58.119	2 7.948	2 17.778	2 27.607	1	0.003
2	1 18.964	1 28.794	1 38.623	1 48.453	1 58.282	2 8.112	2 17.941	2 27.771	2	0.005
3	1 19.128	1 28.958	1 38.787	1 48.617	1 58.446	2 8.276	2 18.105	2 27.935	3	0.008
4	1 19.292	1 29.121	1 38.951	1 48.780	1 58.610	2 8.440	2 18.269	2 28.099	4	0.011
5	1 19.456	1 29.285	1 39.115	1 48.944	1 58.774	2 8.603	2 18.433	2 28.263	5	0.014
6	1 19.619	1 29.449	1 39.279	1 49.108	1 58.938	2 8.767	2 18.597	2 28.426	6	0.016
7	1 19.783	1 29.613	1 39.442	1 49.272	1 59.101	2 8.931	2 18.761	2 28.590	7	0.019
8	1 19.947	1 29.777	1 39.606	1 49.436	1 59.265	2 9.095	2 18.924	2 28.754	8	0.022
9	1 20.111	1 29.940	1 39.770	1 49.600	1 59.429	2 9.259	2 19.088	2 28.918	9	0.025
10	1 20.275	1 30.104	1 39.934	1 49.763	1 59.593	2 9.423	2 19.252	2 29.082	10	0.027
11	1 20.439	1 30.268	1 40.098	1 49.927	1 59.757	2 9.586	2 19.416	2 29.245	11	0.030
12	1 20.602	1 30.432	1 40.261	1 50.091	1 59.921	2 9.750	2 19.580	2 29.409	12	0.033
13	1 20.766	1 30.596	1 40.425	1 50.255	2 0.084	2 9.914	2 19.744	2 29.573	13	0.035
14	1 20.930	1 30.760	1 40.589	1 50.419	2 0.248	2 10.078	2 19.907	2 29.737	14	0.038
15	1 21.094	1 30.923	1 40.753	1 50.583	2 0.412	2 10.242	2 20.071	2 29.901	15	0.041
16	1 21.258	1 31.087	1 40.917	1 50.746	2 0.576	2 10.405	2 20.235	2 30.065	16	0.044
17	1 21.422	1 31.251	1 41.081	1 50.910	2 0.740	2 10.569	2 20.399	2 30.228	17	0.046
18	1 21.585	1 31.415	1 41.244	1 51.074	2 0.904	2 10.733	2 20.563	2 30.392	18	0.049
19	1 21.749	1 31.579	1 41.408	1 51.238	2 1.067	2 10.897	2 20.727	2 30.556	19	0.052
20	1 21.913	1 31.743	1 41.572	1 51.402	2 1.231	2 11.061	2 20.890	2 30.720	20	0.055
21	1 22.077	1 31.906	1 41.736	1 51.565	2 1.395	2 11.225	2 21.054	2 30.884	21	0.057
22	1 22.241	1 32.070	1 41.900	1 51.729	2 1.559	2 11.388	2 21.218	2 31.048	22	0.060
23	1 22.404	1 32.234	1 42.064	1 51.893	2 1.723	2 11.552	2 21.382	2 31.211	23	0.063
24	1 22.568	1 32.398	1 42.227	1 52.057	2 1.887	2 11.716	2 21.546	2 31.375	24	0.066
25	1 22.732	1 32.562	1 42.391	1 52.221	2 2.050	2 11.880	2 21.709	2 31.539	25	0.068
26	1 22.896	1 32.726	1 42.555	1 52.385	2 2.214	2 12.044	2 21.873	2 31.703	26	0.071
27	1 23.060	1 32.889	1 42.719	1 52.548	2 2.378	2 12.208	2 22.037	2 31.867	27	0.074
28	1 23.224	1 33.053	1 42.883	1 52.712	2 2.542	2 12.371	2 22.201	2 32.031	28	0.076
29	1 23.387	1 33.217	1 43.047	1 52.876	2 2.706	2 12.535	2 22.365	2 32.194	29	0.079
30	1 23.551	1 33.381	1 43.210	1 53.040	2 2.869	2 12.699	2 22.529	2 32.358	30	0.082
31	1 23.715	1 33.545	1 43.374	1 53.204	2 3.033	2 12.863	2 22.692	2 32.522	31	0.085
32	1 23.879	1 33.708	1 43.538	1 53.368	2 3.197	2 13.027	2 22.856	2 32.686	32	0.087
33	1 24.043	1 33.872	1 43.702	1 53.531	2 3.361	2 13.191	2 23.020	2 32.850	33	0.090
34	1 24.207	1 34.036	1 43.866	1 53.695	2 3.525	2 13.354	2 23.184	2 33.013	34	0.093
35	1 24.370	1 34.200	1 44.029	1 53.859	2 3.689	2 13.518	2 23.348	2 33.177	35	0.096
36	1 24.534	1 34.364	1 44.193	1 54.023	2 3.852	2 13.682	2 23.512	2 33.341	36	0.098
37	1 24.698	1 34.528	1 44.357	1 54.187	2 4.016	2 13.846	2 23.675	2 33.505	37	0.101
38	1 24.862	1 34.691	1 44.521	1 54.351	2 4.180	2 14.010	2 23.839	2 33.669	38	0.104
39	1 25.026	1 34.855	1 44.685	1 54.514	2 4.344	2 14.173	2 24.003	2 33.833	39	0.106
40	1 25.190	1 35.019	1 44.849	1 54.678	2 4.508	2 14.337	2 24.167	2 33.996	40	0.109
41	1 25.353	1 35.183	1 45.012	1 54.842	2 4.672	2 14.501	2 24.331	2 34.160	41	0.112
42	1 25.517	1 35.347	1 45.176	1 55.006	2 4.835	2 14.665	2 24.495	2 34.324	42	0.115
43	1 25.681	1 35.511	1 45.340	1 55.170	2 4.999	2 14.829	2 24.658	2 34.488	43	0.117
44	1 25.845	1 35.674	1 45.504	1 55.333	2 5.163	2 14.993	2 24.822	2 34.652	44	0.120
45	1 26.009	1 35.838	1 45.668	1 55.497	2 5.327	2 15.156	2 24.986	2 34.816	45	0.123
46	1 26.172	1 36.002	1 45.832	1 55.661	2 5.491	2 15.320	2 25.150	2 34.979	46	0.126
47	1 26.336	1 36.166	1 45.995	1 55.825	2 5.655	2 15.484	2 25.314	2 35.143	47	0.128
48	1 26.500	1 36.330	1 46.159	1 55.989	2 5.818	2 15.648	2 25.477	2 35.307	48	0.131
49	1 26.664	1 36.493	1 46.323	1 56.153	2 5.982	2 15.812	2 25.641	2 35.471	49	0.134
50	1 26.828	1 36.657	1 46.487	1 56.316	2 6.146	2 15.976	2 25.805	2 35.635	50	0.137
51	1 26.992	1 36.821	1 46.651	1 56.480	2 6.310	2 16.139	2 25.969	2 35.798	51	0.139
52	1 27.155	1 36.985	1 46.815	1 56.644	2 6.474	2 16.303	2 26.133	2 35.962	52	0.142
53	1 27.319	1 37.149	1 46.978	1 56.808	2 6.637	2 16.467	2 26.297	2 36.126	53	0.145
54	1 27.483	1 37.313	1 47.142	1 56.972	2 6.801	2 16.531	2 26.460	2 36.290	54	0.147
55	1 27.647	1 37.476	1 47.306	1 57.136	2 6.965	2 16.795	2 26.624	2 36.454	55	0.150
56	1 27.811	1 37.640	1 47.470	1 57.299	2 7.129	2 16.959	2 26.788	2 36.618	56	0.153
57	1 27.975	1 37.804	1 47.634	1 57.463	2 7.293	2 17.122	2 26.952	2 36.781	57	0.156
58	1 28.138	1 37.968	1 47.797	1 57.627	2 7.457	2 17.286	2 27.116	2 36.945	58	0.158
59	1 28.302	1 38.132	1 47.961	1 57.791	2 7.620	2 17.450	2 27.280	2 37.109	59	0.161
Sidereal.	8^h	9^h	10^h	11^h	12^h	13^h	14^h	15^h	For Seconds.	

TO BE SUBTRACTED FROM A SIDEREAL TIME INTERVAL.

Sidereal.	16^h	17^h	18^h	19^h	20^h	21^h	22^h	23^h	For Seconds.	
m	m s	m s	m s	m s	m s	m s	m s	m s	s	s
0	2 37.273	2 47.102	2 56.932	3 6.762	3 16.591	3 26.421	3 36.250	3 46.080	0	0.000
1	2 37.437	2 47.266	2 57.096	3 6.925	3 16.755	3 26.585	3 36.414	3 46.244	1	0.003
2	2 37.601	2 47.430	2 57.260	3 7.089	3 16.919	3 26.748	3 36.578	3 46.407	2	0.005
3	2 37.764	2 47.594	2 57.424	3 7.253	3 17.083	3 26.912	3 36.742	3 46.571	3	0.008
4	2 37.928	2 47.758	2 57.587	3 7.417	3 17.246	3 27.076	3 36.906	3 46.735	4	0.011
5	2 38.092	2 47.922	2 57.751	3 7.581	3 17.410	3 27.240	3 37.069	3 46.899	5	0.014
6	2 38.256	2 48.085	2 57.915	3 7.745	3 17.574	3 27.404	3 37.233	3 47.063	6	0.016
7	2 38.420	2 48.249	2 58.079	3 7.908	3 17.738	3 27.568	3 37.397	3 47.227	7	0.019
8	2 38.584	2 48.413	2 58.243	3 8.072	3 17.902	3 27.731	3 37.561	3 47.390	8	0.022
9	2 38.747	2 48.577	2 58.406	3 8.236	3 18.066	3 27.895	3 37.725	3 47.554	9	0.025
10	2 38.911	2 48.741	2 58.570	3 8.400	3 18.229	3 28.059	3 37.889	3 47.718	10	0.027
11	2 39.075	2 48.905	2 58.734	3 8.564	3 18.393	3 28.223	3 38.052	3 47.882	11	0.030
12	2 39.239	2 49.068	2 58.898	3 8.728	3 18.557	3 28.387	3 38.216	3 48.046	12	0.033
13	2 39.403	2 49.232	2 59.062	3 8.891	3 18.721	3 28.550	3 38.380	3 48.210	13	0.035
14	2 39.566	2 49.396	2 59.226	3 9.055	3 18.885	3 28.714	3 38.544	3 48.373	14	0.038
15	2 39.730	2 49.560	2 59.389	3 9.219	3 19.049	3 28.878	3 38.708	3 48.537	15	0.041
16	2 39.894	2 49.724	2 59.553	3 9.383	3 19.212	3 29.042	3 38.871	3 48.701	16	0.044
17	2 40.058	2 49.888	2 59.717	3 9.547	3 19.376	3 29.206	3 39.035	3 48.865	17	0.046
18	2 40.222	2 50.051	2 59.881	3 9.710	3 19.540	3 29.370	3 39.199	3 49.029	18	0.049
19	2 40 386	2 50.215	3 0.045	3 9.874	3 19.704	3 29.533	3 39.363	3 49.193	19	0.052
20	2 40.549	2 50.379	3 0.209	3 10.038	3 19.868	3 29.697	3 39.527	3 49.356	20	0.055
21	2 40.713	2 50.543	3 0.372	3 10.202	3 20.032	3 29.861	3 39.691	3 49.520	21	0.057
22	2 40.877	2 50.707	3 0.536	3 10.366	3 20.195	3 30.025	3 39.854	3 49.684	22	0.060
23	2 41.041	2 50.870	3 0.700	3 10.530	3 20.359	3 30.189	3 40.018	3 49.848	23	0.063
24	2 41.205	2 51.034	3 0.864	3 10.693	3 20.523	3 30.353	3 40.182	3 50.012	24	0.066
25	2 41.369	2 51.198	3 1.028	3 10.857	3 20.687	3 30.516	3 40.346	3 50.175	25	0.068
26	2 41.532	2 51.362	3 1.192	3 11.021	3 20.851	3 30.680	3 40.510	3 50.339	26	0.071
27	2 41.696	2 51.526	3 1.355	3 11.185	3 21.014	3 30.844	3 40.674	3 50.503	27	0.074
28	2 41.860	2 51.690	3 1.519	3 11.349	3 21.178	3 31.008	3 40.837	3 50.667	28	0.076
29	2 42.024	2 51.853	3 1.683	3 11.513	3 21.342	3 31.172	3 41.001	3 50.831	29	0.079
30	2 42.188	2 52.017	3 1.847	3 11.676	3 21.506	3 31.336	3 41.165	3 50.995	30	0.082
31	2 42.352	2 52.181	3 2.011	3 11.840	3 21.670	3 31.499	3 41.329	3 51.158	31	0.085
32	2 42.515	2 52.345	3 2.174	3 12.004	3 21.834	3 31.663	3 41.493	3 51.322	32	0.087
33	2 42.679	2 52.509	3 2.338	3 12.168	3 21.997	3 31.827	3 41.657	3 51.486	33	0.090
34	2 42.843	2 52.673	3 2.502	3 12.332	3 22.161	3 31.991	3 41.820	3 51.650	34	0.093
35	2 43.007	2 52.836	3 2.666	3 12.496	3 22.325	3 32.155	3 41.984	3 51.814	35	0.096
36	2 43.171	2 53.000	3 2.830	3 12.659	3 22.489	3 32.318	3 42.148	3 51.978	36	0.098
37	2 43.334	2 53.164	3 2.994	3 12.823	3 22.653	3 32.482	3 42.312	3 52.141	37	0.101
38	2 43.498	2 53.328	3 3.157	3 12.987	3 22.817	3 32.646	3 42.476	3 52.305	38	0.104
39	2 43.662	2 53.492	3 3.321	3 13.151	3 22.980	3 32.810	3 42.639	3 52.469	39	0.106
40	2 43.826	2 53.656	3 3.485	3 13.315	3 23.144	3 32.974	3 42.803	3 52.633	40	0.109
41	2 43.990	2 53.819	3 3.649	3 13.478	3 23.308	3 33.138	3 42.967	3 52.797	41	0.112
42	2 44.154	2 53.983	3 3.813	3 13.642	3 23.472	3 33.301	3 43.131	3 52.961	42	0.115
43	2 44.317	2 54.147	3 3.977	3 13.806	3 23.636	3 33.465	3 43.295	3 53.124	43	0.117
44	2 44.481	2 54.311	3 4.140	3 13.970	3 23.800	3 33.629	3 43.459	3 53.288	44	0.120
45	2 44.645	2 54.475	3 4.304	3 14.134	3 23.963	3 33.793	3 43.622	3 53.452	45	0.123
46	2 44.809	2 54.638	3 4.468	3 14.298	3 24.127	3 33.957	3 43.786	3 53.616	46	0.126
47	2 44.973	2 54.802	3 4.632	3 14.461	3 24.291	3 34.121	3 43.950	3 53.780	47	0.128
48	2 45.137	2 54.966	3 4.796	3 14.625	3 24.455	3 34.284	3 44.114	3 53.943	48	0.131
49	2 45.300	2 55.130	3 4.960	3 14.789	3 24.619	3 34.448	3 44.278	3 54.107	49	0.134
50	2 45.464	2 55.294	3 5.123	3 14.953	3 24.782	3 34.612	3 44.442	3 54.271	50	0.137
51	2 45.628	2 55.458	3 5.287	3 15.117	3 24.946	3 34.776	3 44.605	3 54.435	51	0.139
52	2 45.792	2 55.621	3 5.451	3 15.281	3 25.110	3 34.940	3 44.769	3 54.599	52	0.142
53	2 45.956	2 55.785	3 5.615	3 15.444	3 25.274	3 35.104	3 44.933	3 54.763	53	0.145
54	2 46.120	2 55.949	3 5.779	3 15.608	3 25.438	3 35.267	3 45.097	3 54.926	54	0.147
55	2 46.283	2 56.113	3 5.942	3 15.772	3 25.602	3 35.431	3 45.261	3 55.090	55	0.150
56	2 46.447	2 56.277	3 6.106	3 15.936	3 25.765	3 35.595	3 45.425	3 55.254	56	0.153
57	2 46.611	2 56.441	3 6.270	3 16.100	3 25.929	3 35.759	3 45.588	3 55.418	57	0.156
58	2 46.775	2 56.604	3 6.434	3 16.264	3 26.093	3 35.923	3 45.752	3 55.582	58	0.158
59	2 46.939	2 56.768	3 6.598	3 16.427	3 26.257	3 36.086	3 45.916	3 55.746	59	0.161
Sidereal.	16^h	17^h	18^h	19^h	20^h	21^h	22^h	23^h	For Seconds.	

TO BE ADDED TO A MEAN TIME INTERVAL.

Mean Solar.	0^h		1^h		2^h		3^h		4^h		5^h		6^h		7^h		For Seconds.	
m	m	s	m	s	m	s	m	s	m	s	m	s	m	s	m	s	s	s
0	0	0.000	0	9.856	0	19.713	0	29.569	0	39.426	0	49.282	0	59.139	1	8.995	0	0.000
1	0	0.164	0	10.021	0	19.877	0	29.734	0	39.590	0	49.447	0	59.303	1	9.160	1	0.003
2	0	0.329	0	10.185	0	20.041	0	29.898	0	39.754	0	49.611	0	59.467	1	9.324	2	0.005
3	0	0.493	0	10.349	0	20.206	0	30.062	0	39.919	0	49.775	0	59.632	1	9.488	3	0.008
4	0	0.657	0	10.514	0	20.370	0	30.227	0	40.083	0	49.939	0	59.796	1	9.652	4	0.011
5	0	0.821	0	10.678	0	20.534	0	30.391	0	40.247	0	50.104	0	59.960	1	9.817	5	0.014
6	0	0.986	0	10.842	0	20.699	0	30.555	0	40.412	0	50.268	1	0.124	1	9.981	6	0.016
7	0	1.150	0	11.006	0	20.863	0	30.719	0	40.576	0	50.432	1	0.289	1	10.145	7	0.019
8	0	1.314	0	11.171	0	21.027	0	30.884	0	40.740	0	50.597	1	0.453	1	10.310	8	0.022
9	0	1.478	0	11.335	0	21.191	0	31.048	0	40.904	0	50.761	1	0.617	1	10.474	9	0.025
10	0	1.643	0	11.499	0	21.356	0	31.212	0	41.069	0	50.925	1	0.782	1	10.638	10	0.027
11	0	1.807	0	11.663	0	21.520	0	31.376	0	41.233	0	51.089	1	0.946	1	10.802	11	0.030
12	0	1.971	0	11.828	0	21.684	0	31.541	0	41.397	0	51.254	1	1.110	1	10.967	12	0.033
13	0	2.136	0	11.992	0	21.849	0	31.705	0	41.561	0	51.418	1	1.274	1	11.131	13	0.036
14	0	2.300	0	12.156	0	22.013	0	31.869	0	41.726	0	51.582	1	1.439	1	11.295	14	0.038
15	0	2.464	0	12.321	0	22.177	0	32.034	0	41.890	0	51.746	1	1.603	1	11.459	15	0.041
16	0	2.628	0	12.485	0	22.341	0	32.198	0	42.054	0	51.911	1	1.767	1	11.624	16	0.044
17	0	2.793	0	12.649	0	22.506	0	32.362	0	42.219	0	52.075	1	1.932	1	11.788	17	0.047
18	0	2.957	0	12.813	0	22.670	0	32.526	0	42.383	0	52.239	1	2.096	1	11.952	18	0.049
19	0	3.121	0	12.978	0	22.834	0	32.691	0	42.547	0	52.404	1	2.260	1	12.117	19	0.052
20	0	3.285	0	13.142	0	22.998	0	32.855	0	42.711	0	52.568	1	2.424	1	12.281	20	0.055
21	0	3.450	0	13.306	0	23.163	0	33.019	0	42.876	0	52.732	1	2.589	1	12.445	21	0.057
22	0	3.614	0	13.471	0	23.327	0	33.183	0	43.040	0	52.896	1	2.753	1	12.609	22	0.060
23	0	3.778	0	13.635	0	23.491	0	33.348	0	43.204	0	53.061	1	2.917	1	12.774	23	0.063
24	0	3.943	0	13.799	0	23.656	0	33.512	0	43.368	0	53.225	1	3.081	1	12.938	24	0.066
25	0	4.107	0	13.963	0	23.820	0	33.676	0	43.533	0	53.389	1	3.246	1	13.102	25	0.068
26	0	4.271	0	14.128	0	23.984	0	33.841	0	43.697	0	53.554	1	3.410	1	13.266	26	0.071
27	0	4.435	0	14.292	0	24.148	0	34.005	0	43.861	0	53.718	1	3.574	1	13.431	27	0.074
28	0	4.600	0	14.456	0	24.313	0	34.169	0	44.026	0	53.882	1	3.739	1	13.595	28	0.077
29	0	4.764	0	14.620	0	24.477	0	34.333	0	44.190	0	54.046	1	3.903	1	13.759	29	0.079
30	0	4.928	0	14.785	0	24.641	0	34.498	0	44.354	0	54.211	1	4.067	1	13.924	30	0.082
31	0	5.093	0	14.949	0	24.805	0	34.662	0	44.518	0	54.375	1	4.231	1	14.088	31	0.085
32	0	5.257	0	15.113	0	24.970	0	34.826	0	44.683	0	54.539	1	4.396	1	14.252	32	0.088
33	0	5.421	0	15.278	0	25.134	0	34.990	0	44.847	0	54.703	1	4.560	1	14.416	33	0.090
34	0	5.585	0	15.442	0	25.298	0	35.155	0	45.011	0	54.868	1	4.724	1	14.581	34	0.093
35	0	5.750	0	15.606	0	25.463	0	35.319	0	45.176	0	55.032	1	4.888	1	14.745	35	0.096
36	0	5.914	0	15.770	0	25.627	0	35.483	0	45.340	0	55.196	1	5.053	1	14.909	36	0.099
37	0	6.078	0	15.935	0	25.791	0	35.648	0	45.504	0	55.361	1	5.217	1	15.073	37	0.101
38	0	6.242	0	16.099	0	25.955	0	35.812	0	45.668	0	55.525	1	5.381	1	15.238	38	0.104
39	0	6.407	0	16.263	0	26.120	0	35.976	0	45.833	0	55.689	1	5.546	1	15.402	39	0.107
40	0	6.571	0	16.427	0	26.284	0	36.140	0	45.997	0	55.853	1	5.710	1	15.566	40	0.110
41	0	6.735	0	16.592	0	26.448	0	36.305	0	46.161	0	56.018	1	5.874	1	15.731	41	0.112
42	0	6.900	0	16.756	0	26.612	0	36.469	0	46.325	0	56.182	1	6.038	1	15.895	42	0.115
43	0	7.064	0	16.920	0	26.777	0	36.633	0	46.490	0	56.346	1	6.203	1	16.059	43	0.118
44	0	7.228	0	17.085	0	26.941	0	36.798	0	46.654	0	56.510	1	6.367	1	16.223	44	0.120
45	0	7.392	0	17.249	0	27.105	0	36.962	0	46.818	0	56.675	1	6.531	1	16.388	45	0.123
46	0	7.557	0	17.413	0	27.270	0	37.126	0	46.983	0	56.839	1	6.695	1	16.552	46	0.126
47	0	7.721	0	17.577	0	27.434	0	37.290	0	47.147	0	57.003	1	6.860	1	16.716	47	0.129
48	0	7.885	0	17.742	0	27.598	0	37.455	0	47.311	0	57.168	1	7.024	1	16.881	48	0.131
49	0	8.049	0	17.906	0	27.762	0	37.619	0	47.475	0	57.332	1	7.188	1	17.045	49	0.134
50	0	8.214	0	18.070	0	27.927	0	37.783	0	47.640	0	57.496	1	7.353	1	17.209	50	0.137
51	0	8.378	0	18.234	0	28.091	0	37.947	0	47.804	0	57.660	1	7.517	1	17.373	51	0.140
52	0	8.542	0	18.399	0	28.255	0	38.112	0	47.968	0	57.825	1	7.681	1	17.538	52	0.142
53	0	8.707	0	18.563	0	28.420	0	38.276	0	48.132	0	57.989	1	7.845	1	17.702	53	0.145
54	0	8.871	0	18.727	0	28.584	0	38.440	0	48.297	0	58.153	1	8.010	1	17.866	54	0.148
55	0	9.035	0	18.892	0	28.748	0	38.605	0	48.461	0	58.317	1	8.174	1	18.030	55	0.151
56	0	9.199	0	19.056	0	28.912	0	38.769	0	48.625	0	58.482	1	8.338	1	18.195	56	0.153
57	0	9.364	0	19.220	0	29.077	0	38.933	0	48.790	0	58.646	1	8.502	1	18.359	57	0.156
58	0	9.528	0	19.384	0	29.241	0	39.097	0	48.954	0	58.810	1	8.667	1	18.523	58	0.159
59	0	9.692	0	19.549	0	29.405	0	39.262	0	49.118	0	58.975	1	8.831	1	18.688	59	0.162
Mean Solar.	0^h		1^h		2^h		3^h		4^h		5^h		6^h		7^h		For Seconds.	

TO BE ADDED TO A MEAN TIME INTERVAL.

Mean Solar.	8^h	9^h	10^h	11^h	12^h	13^h	14^h	15^h	For Seconds.	
m	m s	m s	m s	m s	m s	m s	m s	m s	s	s
0	1 18.852	1 28.708	1 38.565	1 48.421	1 58.278	2 8.134	2 17.991	2 27.847	0	0.000
1	1 19.016	1 28.873	1 38.729	1 48.585	1 58.442	2 8.298	2 18.155	2 28.011	1	0.003
2	1 19.180	1 29.037	1 38.893	1 48.750	1 58.606	2 8.463	2 18.319	2 28.176	2	0.005
3	1 19.345	1 29.201	1 39.058	1 48.914	1 58.771	2 8.627	2 18.483	2 28.340	3	0.008
4	1 19.509	1 29.365	1 39.222	1 49.078	1 58.935	2 8.791	2 18.648	2 28.504	4	0.011
5	1 19.673	1 29.530	1 39.386	1 49.243	1 59.099	2 8.956	2 18.812	2 28.668	5	0.014
6	1 19.837	1 29.694	1 39.550	1 49.407	1 59.263	2 9.120	2 18.976	2 28.833	6	0.016
7	1 20.002	1 29.858	1 39.715	1 49.571	1 59.428	2 9.284	2 19.141	2 28.997	7	0.019
8	1 20.166	1 30.022	1 39.879	1 49.735	1 59.592	2 9.448	2 19.305	2 29.161	8	0.022
9	1 20.330	1 30.187	1 40.043	1 49.900	1 59.756	2 9.613	2 19.469	2 29.326	9	0.025
10	1 20.495	1 30.351	1 40.207	1 50.064	1 59.920	2 9.777	2 19.633	2 29.490	10	0.027
11	1 20.659	1 30.515	1 40.372	1 50.228	2 0.085	2 9.941	2 19.798	2 29.654	11	0.030
12	1 20.823	1 30.680	1 40.536	1 50.393	2 0.249	2 10.105	2 19.962	2 29.818	12	0.033
13	1 20.987	1 30.844	1 40.700	1 50.557	2 0.413	2 10.270	2 20.126	2 29.983	13	0.036
14	1 21.152	1 31.008	1 40.865	1 50.721	2 0.578	2 10.434	2 20.290	2 30.147	14	0.038
15	1 21.316	1 31.172	1 41.029	1 50.885	2 0.742	2 10.598	2 20.455	2 30.311	15	0.041
16	1 21.480	1 31.337	1 41.193	1 51.050	2 0.906	2 10.763	2 20.619	2 30.476	16	0.044
17	1 21.644	1 31.501	1 41.357	1 51.214	2 1.070	2 10.927	2 20.783	2 30.640	17	0.047
18	1 21.809	1 31.665	1 41.522	1 51.378	2 1.235	2 11.091	2 20.948	2 30.804	18	0.049
19	1 21.973	1 31.829	1 41.686	1 51.542	2 1.399	2 11.255	2 21.112	2 30.968	19	0.052
20	1 22.137	1 31.994	1 41.850	1 51.707	2 1.563	2 11.420	2 21.276	2 31.133	20	0.055
21	1 22.302	1 32.158	1 42.015	1 51.871	2 1.727	2 11.584	2 21.440	2 31.297	21	0.057
22	1 22.466	1 32.322	1 42.179	1 52.035	2 1.892	2 11.748	2 21.605	2 31.461	22	0.060
23	1 22.630	1 32.487	1 42.343	1 52.200	2 2.056	2 11.912	2 21.769	2 31.625	23	0.063
24	1 22.794	1 32.651	1 42.507	1 52.364	2 2.220	2 12.077	2 21.933	2 31.790	24	0.066
25	1 22.959	1 32.815	1 42.672	1 52.528	2 2.385	2 12.241	2 22.098	2 31.954	25	0.068
26	1 23.123	1 32.979	1 42.836	1 52.692	2 2.549	2 12.405	2 22.262	2 32.118	26	0.071
27	1 23.287	1 33.144	1 43.000	1 52.857	2 2.713	2 12.570	2 22.426	2 32.283	27	0.074
28	1 23.451	1 33.308	1 43.164	1 53.021	2 2.877	2 12.734	2 22.590	2 32.447	28	0.077
29	1 23.616	1 33.472	1 43.329	1 53.185	2 3.042	2 12.898	2 22.755	2 32.611	29	0.079
30	1 23.780	1 33.637	1 43.493	1 53.349	2 3.206	2 13.062	2 22.919	2 32.775	30	0.082
31	1 23.944	1 33.801	1 43.657	1 53.514	2 3.370	2 13.227	2 23.083	2 32.940	31	0.085
32	1 24.109	1 33.965	1 43.822	1 53.678	2 3.534	2 13.391	2 23.247	2 33.104	32	0.088
33	1 24.273	1 34.129	1 43.986	1 53.842	2 3.699	2 13.555	2 23.412	2 33.268	33	0.090
34	1 24.437	1 34.294	1 44.150	1 54.007	2 3.863	2 13.720	2 23.576	2 33.432	34	0.093
35	1 24.601	1 34.458	1 44.314	1 54.171	2 4.027	2 13.884	2 23.740	2 33.597	35	0.096
36	1 24.766	1 34.622	1 44.479	1 54.335	2 4.192	2 14.048	2 23.905	2 33.761	36	0.099
37	1 24.930	1 34.786	1 44.643	1 54.499	2 4.356	2 14.212	2 24.069	2 33.925	37	0.101
38	1 25.094	1 34.951	1 44.807	1 54.664	2 4.520	2 14.377	2 24.233	2 34.090	38	0.104
39	1 25.259	1 35.115	1 44.971	1 54.828	2 4.684	2 14.541	2 24.397	2 34.254	39	0.107
40	1 25.423	1 35.279	1 45.136	1 54.992	2 4.849	2 14.705	2 24.562	2 34.418	40	0.110
41	1 25.587	1 35.444	1 45.300	1 55.156	2 5.013	2 14.869	2 24.726	2 34.582	41	0.112
42	1 25.751	1 35.608	1 45.464	1 55.321	2 5.177	2 15.034	2 24.890	2 34.747	42	0.115
43	1 25.916	1 35.772	1 45.629	1 55.485	2 5.342	2 15.198	2 25.054	2 34.911	43	0.118
44	1 26.080	1 35.936	1 45.793	1 55.649	2 5.506	2 15.362	2 25.219	2 35.075	44	0.120
45	1 26.244	1 36.101	1 45.957	1 55.814	2 5.670	2 15.527	2 25.383	2 35.239	45	0.123
46	1 26.408	1 36.265	1 46.121	1 55.978	2 5.834	2 15.691	2 25.547	2 35.404	46	0.126
47	1 26.573	1 36.429	1 46.286	1 56.142	2 5.999	2 15.855	2 25.712	2 35.568	47	0.129
48	1 26.737	1 36.593	1 46.450	1 56.306	2 6.163	2 16.019	2 25.876	2 35.732	48	0.131
49	1 26.901	1 36.758	1 46.614	1 56.471	2 6.327	2 16.184	2 26.040	2 35.897	49	0.134
50	1 27.066	1 36.922	1 46.778	1 56.635	2 6.491	2 16.348	2 26.204	2 36.061	50	0.137
51	1 27.230	1 37.086	1 46.943	1 56.799	2 6.656	2 16.512	2 26.369	2 36.225	51	0.140
52	1 27.394	1 37.251	1 47.107	1 56.964	2 6.820	2 16.676	2 26.533	2 36.389	52	0.142
53	1 27.558	1 37.415	1 47.271	1 57.128	2 6.984	2 16.841	2 26.697	2 36.554	53	0.145
54	1 27.723	1 37.579	1 47.436	1 57.292	2 7.149	2 17.005	2 26.861	2 36.718	54	0.148
55	1 27.887	1 37.743	1 47.600	1 57.456	2 7.313	2 17.169	2 27.026	2 36.882	55	0.151
56	1 28.051	1 37.908	1 47.764	1 57.621	2 7.477	2 17.334	2 27.190	2 37.047	56	0.153
57	1 28.215	1 38.072	1 47.928	1 57.785	2 7.641	2 17.498	2 27.354	2 37.211	57	0.156
58	1 28.380	1 38.236	1 48.093	1 57.949	2 7.806	2 17.662	2 27.519	2 37.375	58	0.159
59	1 28.544	1 38.400	1 48.257	1 58.113	2 7.970	2 17.826	2 27.683	2 37.539	59	0.162
Mean Solar.	8^h	9^h	10^h	11^h	12^h	13^h	14^h	15^h	For Seconds.	

TO BE ADDED TO A MEAN TIME INTERVAL.

Mean Solar.	16^h	17^h	18^h	19^h	20^h	21^h	22^h	23^h	For Seconds.	
m	m s	m s	m s	m s	m s	m s	m s	m s	s	s
0	2 37.704	2 47.560	2 57.417	3 7.273	3 17.129	3 26.986	3 36.842	3 46.699	0	0.000
1	2 37.868	2 47.724	2 57.581	3 7.437	3 17.294	3 27.150	3 37.007	3 46.863	1	0.003
2	2 38.032	2 47.889	2 57.745	3 7.602	3 17.458	3 27.315	3 37.171	3 47.027	2	0.005
3	2 38.196	2 48.053	2 57.909	3 7.766	3 17.622	3 27.479	3 37.335	3 47.192	3	0.008
4	2 38.361	2 48.217	2 58.074	3 7.930	3 17.787	3 27.643	3 37.500	3 47.356	4	0.011
5	2 38.525	2 48.381	2 58.238	3 8.094	3 17.951	3 27.807	3 37.664	3 47.520	5	0.014
6	2 38.689	2 48.546	2 58.402	3 8.259	3 18.115	3 27.972	3 37.828	3 47.685	6	0.016
7	2 38.854	2 48.710	2 58.566	3 8.423	3 18.279	3 28.136	3 37.992	3 47.849	7	0.019
8	2 39.018	2 48.874	2 58.731	3 8.587	3 18.444	3 28.300	3 38.157	3 48.013	8	0.022
9	2 39.182	2 49.039	2 58.895	3 8.751	3 18.608	3 28.464	3 38.321	3 48.177	9	0.025
10	2 39.346	2 49.203	2 59.059	3 8.916	3 18.772	3 28.629	3 38.485	3 48.342	10	0.027
11	2 39.511	2 49.367	2 59.224	3 9.080	3 18.937	3 28.793	3 38.649	3 48.506	11	0.030
12	2 39.675	2 49.531	2 59.388	3 9.244	3 19.101	3 28.957	3 38.814	3 48.670	12	0.033
13	2 39.839	2 49.696	2 59.552	3 9.409	3 19.265	3 29.122	3 38.978	3 48.834	13	0.036
14	2 40.003	2 49.860	2 59.716	3 9.573	3 19.429	3 29.286	3 39.142	3 48.999	14	0.038
15	2 40.168	2 50.024	2 59.881	3 9.737	3 19.594	3 29.450	3 39.307	3 49.163	15	0.041
16	2 40.332	2 50.188	3 0.045	3 9.901	3 19.758	3 29.614	3 39.471	3 49.327	16	0.044
17	2 40.496	2 50.353	3 0.209	3 10.066	3 19.922	3 29.779	3 39.635	3 49.492	17	0.047
18	2 40.661	2 50.517	3 0.373	3 10.230	3 20.086	3 29.943	3 39.799	3 49.656	18	0.049
19	2 40.825	2 50.681	3 0.538	3 10.394	3 20.251	3 30.107	3 39.964	3 49.820	19	0.052
20	2 40.989	2 50.846	3 0.702	3 10.559	3 20.415	3 30.271	3 40.128	3 49.984	20	0.055
21	2 41.153	2 51.010	3 0.866	3 10.723	3 20.579	3 30.436	3 40.292	3 50.149	21	0.057
22	2 41.318	2 51.174	3 1.031	3 10.887	3 20.744	3 30.600	3 40.456	3 50.313	22	0.060
23	2 41.482	2 51.338	3 1.195	3 11.051	3 20.908	3 30.764	3 40.621	3 50.477	23	0.063
24	2 41.646	2 51.503	3 1.359	3 11.216	3 21.072	3 30.929	3 40.785	3 50.642	24	0.066
25	2 41.810	2 51.667	3 1.523	3 11.380	3 21.236	3 31.093	3 40.949	3 50.806	25	0.068
26	2 41.975	2 51.831	3 1.688	3 11.544	3 21.401	3 31.257	3 41.114	3 50.970	26	0.071
27	2 42.139	2 51.995	3 1.852	3 11.708	3 21.565	3 31.421	3 41.278	3 51.134	27	0.074
28	2 42.303	2 52.160	3 2.016	3 11.873	3 21.729	3 31.586	3 41.442	3 51.299	28	0.077
29	2 42.468	2 52.324	3 2.181	3 12.037	3 21.893	3 31.750	3 41.606	3 51.463	29	0.079
30	2 42.632	2 52.488	3 2.345	3 12.201	3 22.058	3 31.914	3 41.771	3 51.627	30	0.082
31	2 42.796	2 52.653	3 2.509	3 12.366	3 22.222	3 32.078	3 41.935	3 51.791	31	0.085
32	2 42.960	2 52.817	3 2.673	3 12.530	3 22.386	3 32.243	3 42.099	3 51.956	32	0.088
33	2 43.125	2 52.981	3 2.838	3 12.694	3 22.551	3 32.407	3 42.264	3 52.120	33	0.090
34	2 43.289	2 53.145	3 3.002	3 12.858	3 22.715	3 32.571	3 42.428	3 52.284	34	0.093
35	2 43.453	2 53.310	3 3.166	3 13.023	3 22.879	3 32.736	3 42.592	3 52.449	35	0.096
36	2 43.617	2 53.474	3 3.330	3 13.187	3 23.043	3 32.900	3 42.756	3 52.613	36	0.099
37	2 43.782	2 53.638	3 3.495	3 13.351	3 23.208	3 33.064	3 42.921	3 52.777	37	0.101
38	2 43.946	2 53.803	3 3.659	3 13.515	3 23.372	3 33.228	3 43.085	3 52.941	38	0.104
39	2 44.110	2 53.967	3 3.823	3 13.680	3 23.536	3 33.393	3 43.249	3 53.106	39	0.107
40	2 44.275	2 54.131	3 3.988	3 13.844	3 23.700	3 33.557	3 43.413	3 53.270	40	0.110
41	2 44.439	2 54.295	3 4.152	3 14.008	3 23.865	3 33.721	3 43.578	3 53.434	41	0.112
42	2 44.603	2 54.460	3 4.316	3 14.173	3 24.029	3 33.886	3 43.742	3 53.598	42	0.115
43	2 44.767	2 54.624	3 4.480	3 14.337	3 24.193	3 34.050	3 43.906	3 53.763	43	0.118
44	2 44.932	2 54.788	3 4.645	3 14.501	3 24.358	3 34.214	3 44.071	3 53.929	44	0.120
45	2 45.096	2 54.952	3 4.809	3 14.665	3 24.522	3 34.378	3 44.235	3 54.091	45	0.123
46	2 45.260	2 55.117	3 4.973	3 14.830	3 24.686	3 34.543	3 44.399	3 54.256	46	0.126
47	2 45.425	2 55.281	3 5.137	3 14.994	3 24.850	3 34.707	3 44.563	3 54.420	47	0.129
48	2 45.589	2 55.445	3 5.302	3 15.158	3 25.015	3 34.871	3 44.728	3 54.584	48	0.131
49	2 45.753	2 55.610	3 5.466	3 15.322	3 25.179	3 35.035	3 44.892	3 54.748	49	0.134
50	2 45.917	2 55.774	3 5.630	3 15.487	3 25.343	3 35.200	3 45.056	3 54.913	50	0.137
51	2 46.082	2 55.938	3 5.795	3 15.651	3 25.508	3 35.364	3 45.220	3 55.077	51	0.140
52	2 46.246	2 56.102	3 5.959	3 15.815	3 25.672	3 35.528	3 45.385	3 55.241	52	0.142
53	2 46.410	2 56.267	3 6.123	3 15.980	3 25.836	3 35.693	3 45.549	3 55.405	53	0.145
54	2 46.574	2 56.431	3 6.287	3 16.144	3 26.000	3 35.857	3 45.713	3 55.570	54	0.148
55	2 46.739	2 56.595	3 6.452	3 16.308	3 26.165	3 36.021	3 45.878	3 55.734	55	0.151
56	2 46.903	2 56.759	3 6.616	3 16.472	3 26.329	3 36.185	3 46.042	3 55.898	56	0.153
57	2 47.067	2 56.924	3 6.780	3 16.637	3 26.493	3 36.350	3 46.206	3 56.063	57	0.156
58	2 47.232	2 57.088	3 6.944	3 16.801	3 26.657	3 36.514	3 46.370	3 56.227	58	0.159
59	2 47.396	2 57.252	3 7.109	3 16.965	3 26.822	3 36.678	3 46.535	3 56.391	59	0.162
Mean Solar.	16^h	17^h	18^h	19^h	20^h	21^h	22^h	23^h	For Seconds.	

TABLE FOR FINDING THE LATITUDE BY AN OBSERVED ALTITUDE OF POLARIS.

Reduce the observed altitude of Polaris to the true altitude.

Reduce the recorded time of observation to the local sidereal time.

If the sidereal time is
- less than 1h 26m.5, subtract it from 1h 26m.5;
- between 1h 26m.5 and 13h 26m.5, subtract 1h 26m.5 from it;
- greater than 13h 26m.5, subtract it from 25h 26m.5;

and the remainder is the hour-angle of Polaris.

With this hour-angle take out the correction from Table IV (below), and add it to or subtract it from the true altitude, according to its sign. The result is the approximate latitude of the place.

Example.—1909, October 27, at 10h 40m 30s, P. M., mean solar time, in longitude 29° east of Greenwich, suppose the true altitude of Polaris to be 43° 20′: required the latitude of the place.

	h	m	s
Local astronomical mean time	10	40	30
Reduction from Table III, for 10h 40m 30s	+	1	45
Greenwich sidereal time of mean noon, October 27, page 165 .	14	20	49
Reduction from Table III, for longitude (= 1h 56m east, or minus)	—	0	19
Sum (having regard to signs) is equal to local sidereal time .	1	2	45

	h	m	s
	1	26	30
Subtract sidereal time	1	2	45
Remainder is equal to hour-angle of Polaris . . .	0	23	45

		°	′
True altitude . . .	+	43	20
Correction from Table IV (below)	—	1	10
Approximate latitude . .	+	42	10

TABLE IV—1909.

Hour-angle.	0h		1h		2h		3h		4h		5h	
m	° ′	′	° ′	′	° ′	′	° ′	′	° ′	′	° ′	′
0	−1 10.7	0.0	−1 8.3	0.4	−1 1.1	0.8	−0 49.7	1.2	−0 34.8	1.3	−0 17.6	1.5
5	1 10.7	0.0	1 7.9	0.5	1 0.3	0.8	0 48.5	1.1	0 33.5	1.4	0 16.1	1.5
10	1 10.7	0.1	1 7.4	0.5	0 59.5	0.9	0 47.4	1.2	0 32.1	1.4	0 14.6	1.5
15	1 10.6	0.1	1 6.9	0.5	0 58.6	0.9	0 46.2	1.2	0 30.7	1.4	0 13.1	1.5
20	−1 10.5	0.2	−1 6.4	0.6	−0 57.7	0.9	−0 45.0	1.2	−0 29.3	1.4	−0 11.6	1.6
25	1 10.3	0.2	1 5.8	0.5	0 56.8	0.9	0 43.8	1.2	0 27.9	1.4	0 10.0	1.5
30	1 10.1	0.2	1 5.3	0.6	0 55.9	1.0	0 42.6	1.2	0 26.5	1.5	0 8.5	1.5
35	1 9.9	0.2	1 4.7	0.7	0 54.9	1.0	0 41.4	1.3	0 25.0	1.4	0 7.0	1.6
40	−1 9.7	0.3	−1 4.0	0.7	−0 53.9	1.0	−0 40.1	1.3	−0 23.6	1.5	−0 5.4	1.5
45	1 9.4	0.4	1 3.3	0.7	0 52.9	1.1	0 38.8	1.3	0 22.1	1.5	0 3.9	1.5
50	1 9.0	0.3	1 2.6	0.7	0 51.8	1.0	0 37.5	1.3	0 20.6	1.5	0 2.4	1.6
55	1 8.7	0.4	1 1.9	0.8	0 50.8	1.1	0 36.2	1.4	0 19.1	1.5	−0 0.8	1.5
60	−1 8.3		−1 1.1		−0 49.7		−0 34.8		−0 17.6		+0 0.7	

Hour-angle.	6h		7h		8h		9h		10h		11h	
m	° ′	′	° ′	′	° ′	′	° ′	′	° ′	′	° ′	′
0	+0 0.7	1.6	+0 19.0	1.5	+0 35.9	1.3	+0 50.4	1.1	+1 1.5	0.7	+1 8.4	0.4
5	0 2.3	1.5	0 20.5	1.4	0 37.2	1.3	0 51.5	1.0	1 2.2	0.7	1 8.8	0.3
10	0 3.8	1.6	0 21.9	1.5	0 38.5	1.3	0 52.5	1.0	1 2.9	0.7	1 9.1	0.3
15	0 5.4	1.5	0 23.4	1.4	0 39.8	1.3	0 53.5	1.0	1 3.6	0.7	1 9.4	0.3
20	+0 6.9	1.5	+0 24.8	1.5	+0 41.1	1.2	+0 54.5	1.0	+1 4.3	0.6	+1 9.7	0.2
25	0 8.4	1.6	0 26.3	1.4	0 42.3	1.2	0 55.5	0.9	1 4.9	0.6	1 9.9	0.3
30	0 10.0	1.5	0 27.7	1.4	0 43.5	1.2	0 56.4	0.9	1 5.5	0.5	1 10.2	0.2
35	0 11.5	1.5	0 29.1	1.4	0 44.7	1.2	0 57.3	0.9	1 6.0	0.6	1 10.4	0.1
40	+0 13.0	1.5	+0 30.5	1.4	+0 45.9	1.2	+0 58.2	0.8	+1 6.6	0.5	+1 10.5	0.1
45	0 14.5	1.5	0 31.9	1.3	0 47.1	1.1	0 59.0	0.9	1 7.1	0.4	1 10.6	0.1
50	0 16.0	1.5	0 33.2	1.4	0 48.2	1.1	0 59.9	0.8	1 7.5	0.5	1 10.7	0.0
55	0 17.5	1.5	0 34.6	1.3	0 49.3	1.1	1 0.7	0.8	1 8.0	0.4	1 10.7	0.0
60	+0 19.0		+0 35.9		+0 50.4		+1 1.5		+1 8.4		+1 10.7	

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